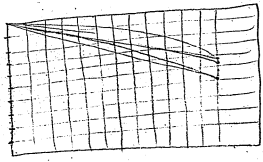
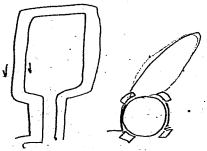
Lamp Factory Notebook, N-86-10-08

This notebook dates from October 1886. All of the technical entries are by Edison and relate to armature design and to carbon treating experiments for lamp filaments. Many of the pages were used to record the names and addresses of various suppliers. A few of these entries are in Edison's hand. The remainder are in the hand of an unknown laboratory assistant. The label on the spine has been torn and the number is missing. The book contains approximately 200 unnumbered pages. Numerous pages have been torn out of the book.

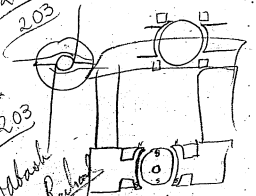


6 H 16 1 59
9 48½
33. 7.

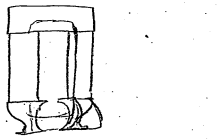
18
10
26
1200

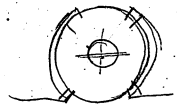


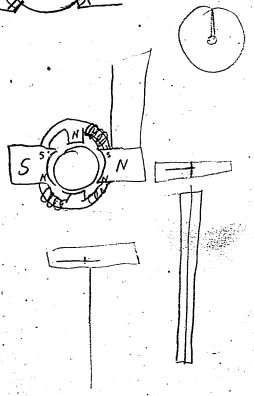
203
203
203

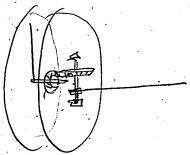


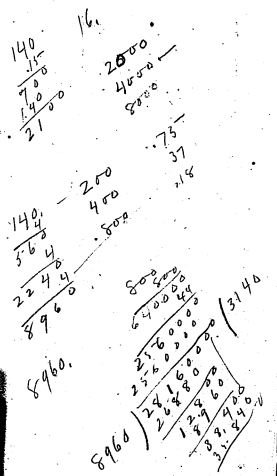
Wabash Valley Power Association






S
N
S
N





Oct 8 1886 Tue —

Boil 15 Carbons in strong KO Solution for one day then boil in large quantity H_2O for 4 hours then change water again & boil 4 hours then take out & put in heater, dry and put in order No 20 & Coal for 3 days — Then Carbonize

do the same with the HF acid carbons now Soaking —

Oct 8. 1886 Tar

Wash 3 lamps in Chloride Barium Sol weak - to precip the SO_4 from clamps. — Work & set up for life —

Immerse carbon & clamp in gasolene & use another wire to form an arc on clamp so as to decompose $CuSO_4$ & also the oxide — think it will remain bright afterward

Oct 8 1886 —

Use precipitated Magnesia & alumina — precipitate from very dilute Solutions so as to get them Exceedingly finely divided —

Mix the dried precipates with — 1st Sugar Solution, Liquorice, Gum arabic, Tar, Molasses, Honey, gum tragacanth, press through mould into filaments. Dry Lines mixed with the above also (Linked lines)

Oct 8 1886

Put piece, asphalt in side cup with U tube, ~~heat~~ get vac

Cut off from Lamp get vac then heat asphalt, + let gas in —

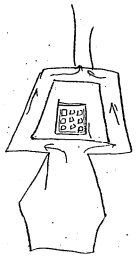
~~Pour ammonia~~

Prepare N. heat Salt of Ammonium Nitrite

also intimate Mixture of Ch P Amount + Bichrom K then gives on heating H_2O + pure N — put in cup on U tube.

of a Formate & treated with Conc SO4 pure CO given off -

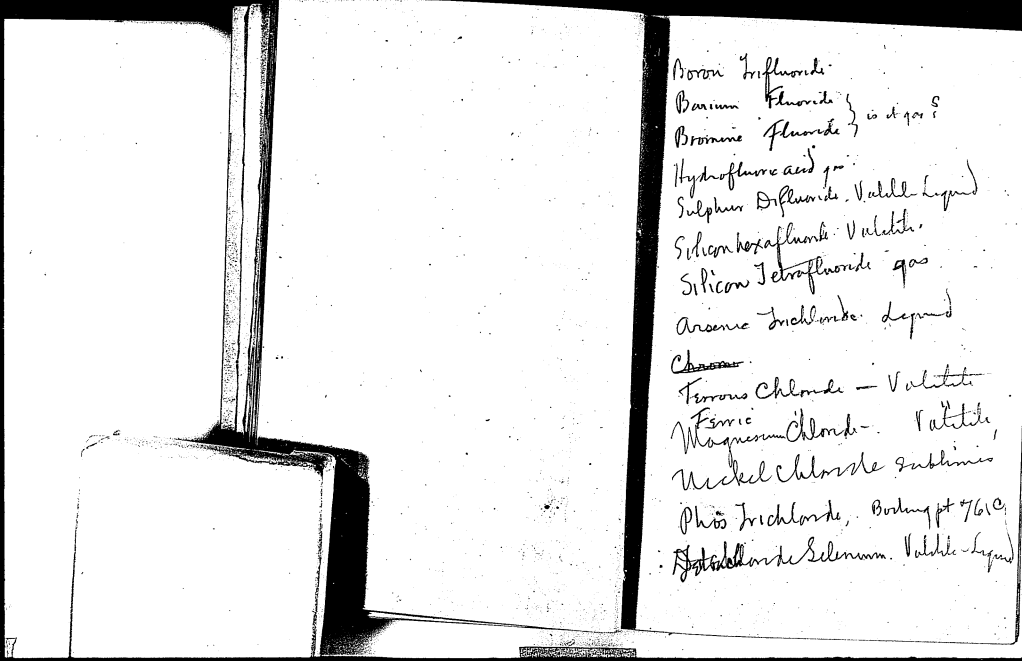
Ferro cy K heated with 1/2 O3 heated with 4 vols O3 SO4 pure gas - care must be taken as at certain point gas comes off almost Explosively -



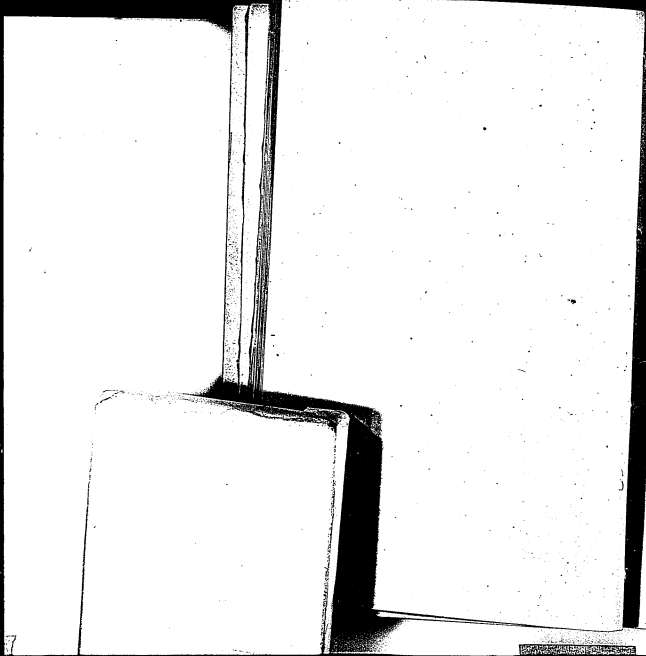
Oct 9 1886

Gases to be used as accessories in the fill lamp

Arseniuretted Hydrogen
Bromine,
Bromohydric acid gas
CO
CO_2
Cl
HCl
H
Iodine
Hydriodic acid
Phos Hydrogen
Sulphuretted Hydrogen
Selenuretted "
Telluretted "



Boron Trifluoride
Barium Fluoride } is it gas?
Bromine Fluoride }
Hydrofluoric acid gas
Sulphur Difluoride. Volatile Liquid
Silicon hexafluoride Volatile.
Silicon Tetrafluoride gas
Arsenic Trichloride. Liquid
~~Chromic~~
Ferrous Chloride — Volatile
Ferric
Magnesium Chloride. Volatile,
Nickel Chloride Sublimes
Phos Trichloride, Boiling pt 76°C
~~Hydrochloric~~ Selenium. Volatile Liquid



Silicon Tetrachloride, boils 50 C

Uranium Tetrachloride, Volatile

Nitrogen Tribromide, Very Volatile.

Zinc phosphide. Volatile.

Hydrogen Silicide Hydri- gas

Chlorobromide Silicon Liquid

Phos Chlorobromide. boils. 90 C

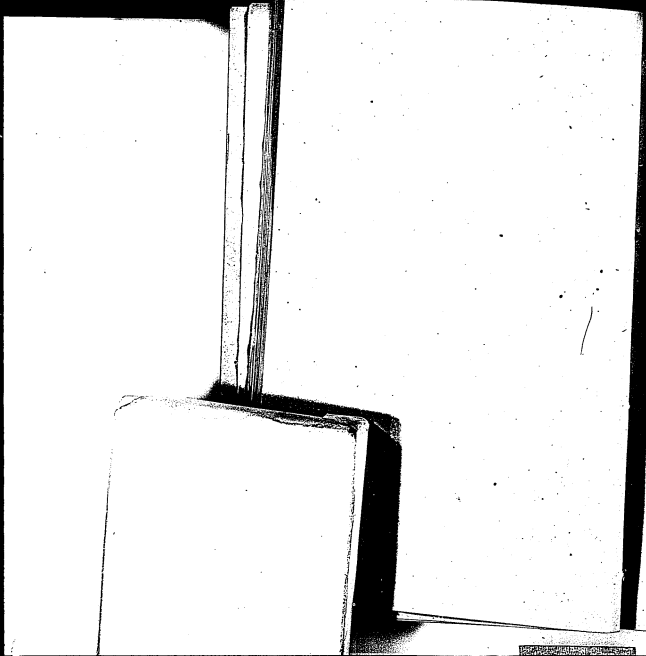
Nitrous Acid

Nitric Acid

Titanium tetrachloride. Boils 135 C

Titanium Tetrafluoride Liquid

Tribromide Boron boils 90. C



Silicon tetrabromide boils 150.C

~~Silicon~~ tetra Zirconium Bromide Easily volatile heat-gas flame

Chlorobromide Silicon boils 100 C

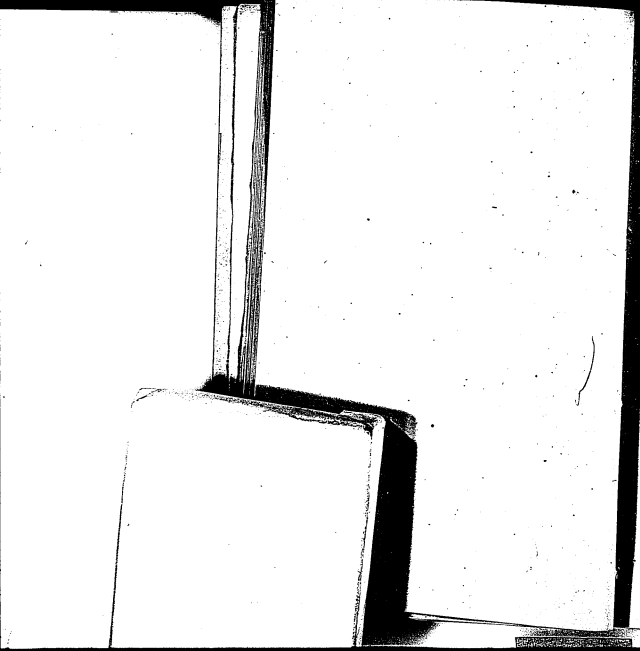
Titanium Chlorobromide " 160

Silicon Chloroform $HSiCl_3$ boils 37°

Hydrogen Silico Chloride Liquid

Titano-phosphochloride Melts 85

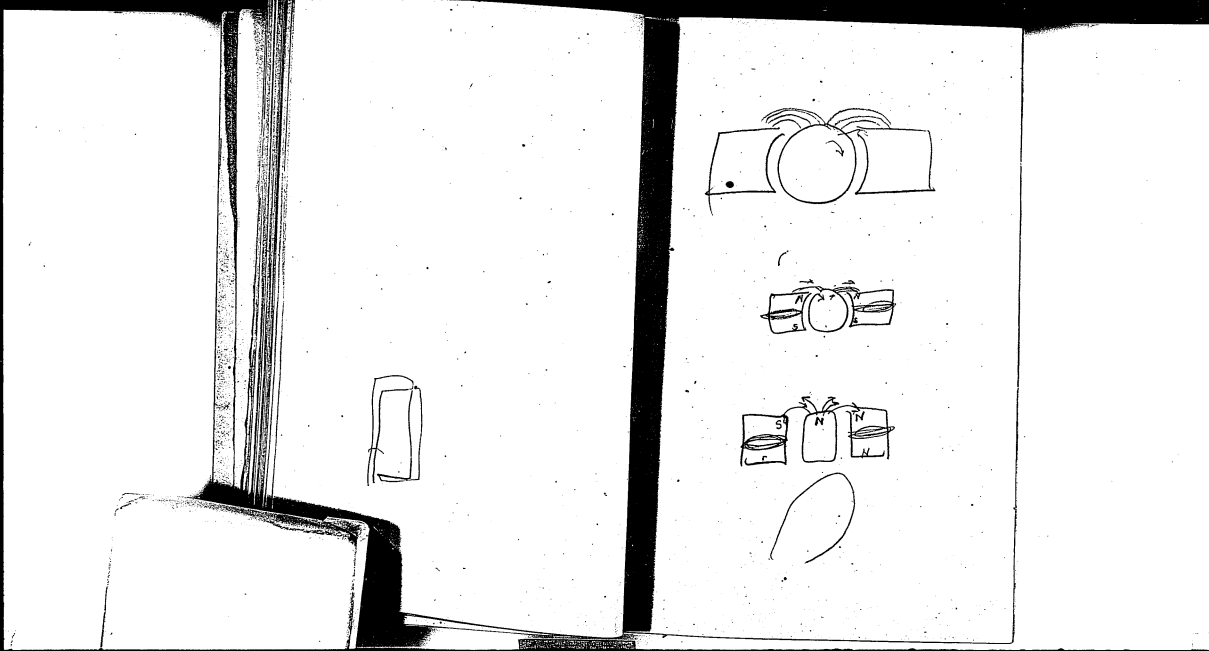
Silicon Hydroform $HSiO_3$ boils 220, Liquid



Olefiant gas Ethylene. gas.
Acetylene gas
Propane. gas
Butylene,
Marbane — Heat Resins
Aniline oil.
Benzol
Benzene.
Amyl.
Kerosene,
Essential oils —
Ether.
Camphor
Creosote,
Carbolic Acid
Turpentine
Camphene
Naptha

Chloral Hydrate

Monosulphide Carbon – (Solid)


S
N
S
N

A. Achard Rue de
60 ~~Rivoli~~ Provence ~~St~~. Paris
France

~~General agent of electricity~~
Agence Générale d'Electricité
Passage des Panoramas, galeries Variétés Paris France

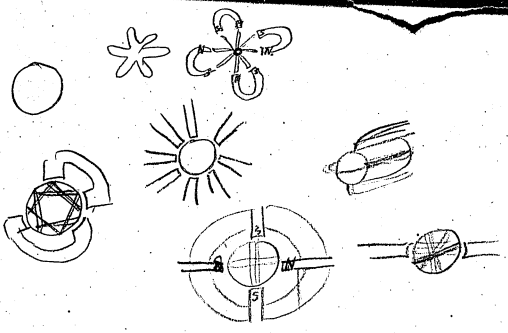
A. Alby Boul du Temple 33
33 and 33 ~~Temple Road~~, Paris
France

Société anonyme de l'Aluminium
Boul Poissonnière 21 Paris France

M. Anthony. Rue de Rovigo 39.
Alger
France

Association Générale de Ouvriers
en ~~Instruments~~ d'Optique.
Rue Pierre-Levée 2 Paris France

Ateliers Duconmun
Boulevard Magenta 18
Paris Fran



Catalogues with price list

J & J Musto & Co
Clinton Road Bow London 8

Wm Reid & Co.
5 Nags Head Court London EC 9

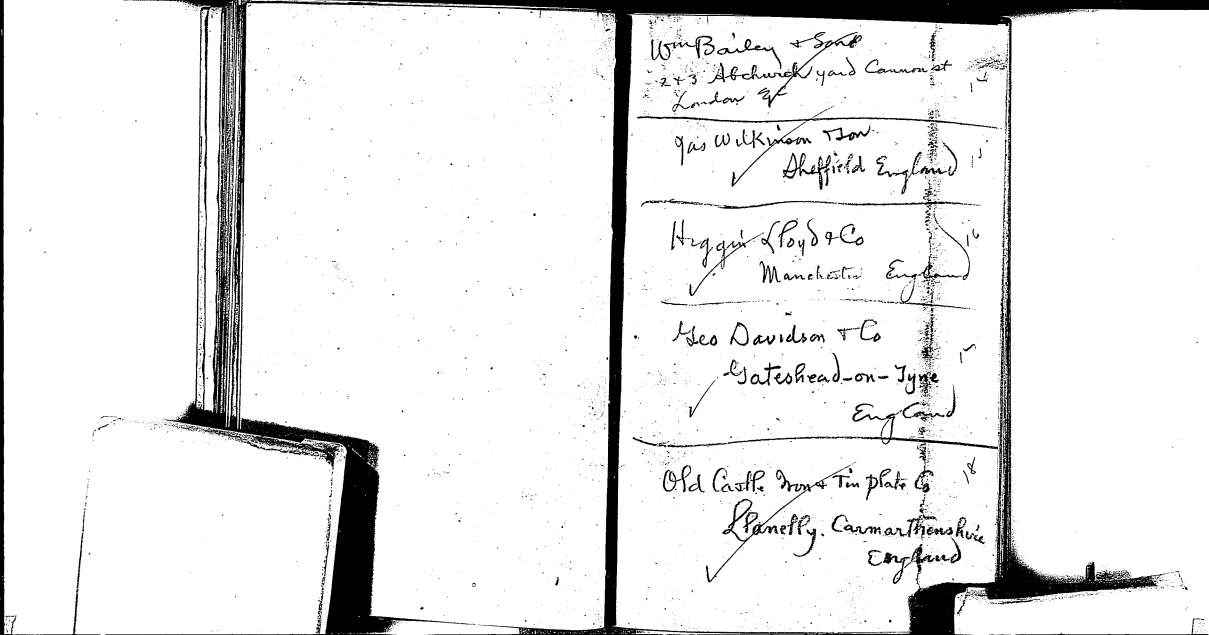
Jas Stiff & Sons
High St Lambeth London S.E. 10

John Warner & Sons
Cripplegate London EC 11

Frederick Allen & Sons
Upper North St Poplar London E 12

A & M Zimmermann
21 Mincing Lane London EC 13

Geo Slater & Co ~~West Bromwich~~
134 Upper Thames st London EC

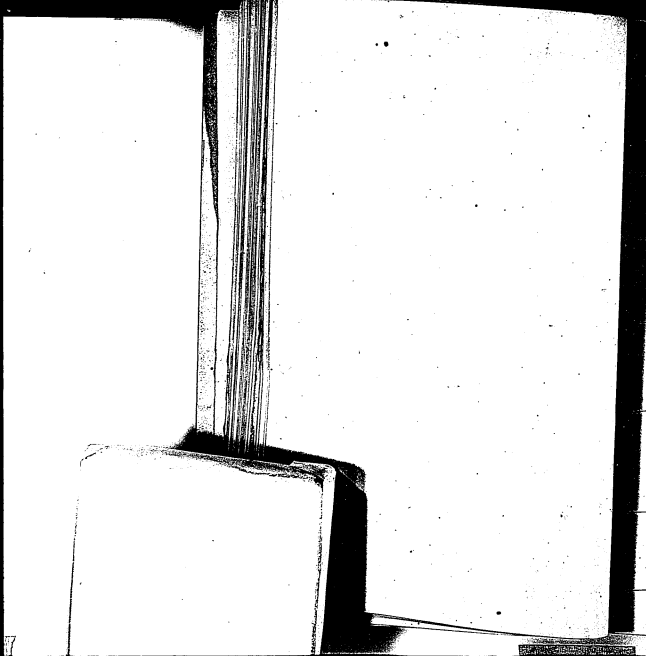

Wm Bailey & Sons
243 Abchurch yard Cannon st
London E.C.
Jas Wilkinson & Son
Sheffield England
Hy Lloyd & Co
Manchester England
Geo Davidson & Co
Gateshead-on-Tyne
England
Old Castle Iron & Tin plate Co
Llanelly. Carmarthenshire
England

Jas MacNeill & Co
25 St Enoch Square
Glasgow
Scotland

Pierre Balajat
Avenue Du Prado 145
Marseille
France

Doulton & Co
High St Lambeth
London SE
England

Patent Plumbago & Crucible Co
Battersea SW
London
Eng



23

Cookson & Co 26. Philpot Lane E C
Newcastle-on-Tyne England

24

Jucheda & Co
41 Moorgate St, E. C.
London, Eng.

25

John Oakey & Sons.
Westminster Bridge, S.E.
London, Eng.

26

Fraser & Grasen
Brookley-By-Bow.
London, E, Eng.

27

Smith, Thomas & Co.
Jersey Road.
Old Kent Road S. E.
London, Eng.

28

Chance Bros, & Co.
24 Spinsbury Circus, E. C.
London, Eng.

James Powell & Sons. 29
Temple St. Whitefriars, E.C.
London, Eng.

~~Hydraulic Engineering Co~~
~~131 Palace Chambers.~~
~~Westminster, Bridge St.~~
~~Asst Mindin~~ ~~S. W.~~ London, Eng.

Tyler, Hayward & Co. 30
84 + 85 Upper Whitecross St, E.C.
London, Eng.

Hydraulic Engineering Co., 31
131 Palace Chambers,
Bridge St, Westminster S. W.
London, Eng.

Dring & Fage
19 + 20 Tooley St. S. E. 32
London, Eng.

Gebhardt, Rottmann & Co
~~24 Lawrence~~, East Lane
24 Farmer Lane, E. C. 33
London

James Hicks -
8 Hatton Garden, E. C. 35
London, Eng.

James Hughes
104 Minories, E.
8. London, Eng. 35

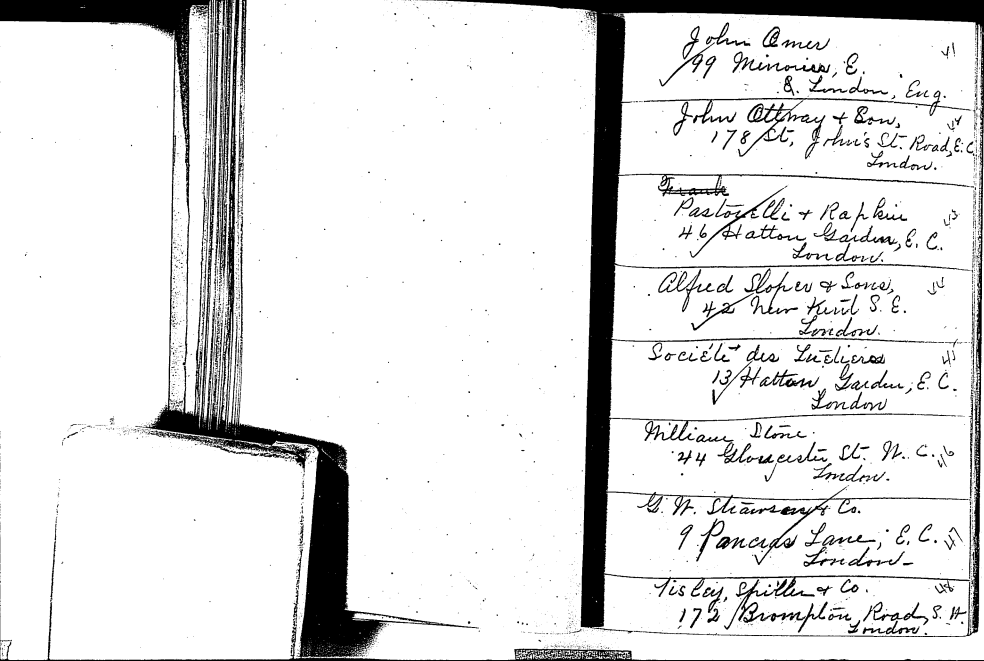
Theodore Kiessler
361 City Road, E. C. 36
E. C. London, Eng.

J. Levi + Co.
42 Castle, Culborn. E. C. 37
E. C. London, Eng.

Gustave Neu.
29 King Square, Goswell Road, E.C. 38
E. C. London.

Frederick Newton & Co.
3 Fleet St. E. C. 39
E. C. London.

Robert Nicholl
53 Holborn - H. 40
H. London.



John Amer
99 Minories, E.
& London, Eng. V1

John Attaway & Sons,
178 Ct, John's Ct. Road, E.C.
London. V2

~~Frank~~
Pastorelli & Rapkin
46 Hatton Garden, E.C.
London. V3

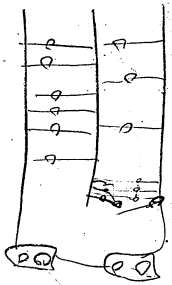
Alfred Slopes & Sons,
42 New Kent S.E.
London. V4

Société des Guêtieres
13 Hatton Garden, E.C.
London V5

William Stone
44 Gloucester Ct. M.C.
London. V6

G. H. Stearns & Co.
9 Pancras Lane, E.C.
London V7

Tisley, Spiller & Co.
172 Brompton Road, S.W.
London. V8



1250
2
2500
1600
4100

32.
600
19200.

10. 30

15
16
90
15
240.

675
30
20250

2700
1600
43.00

9 27
600
16200.

1350
2
2700

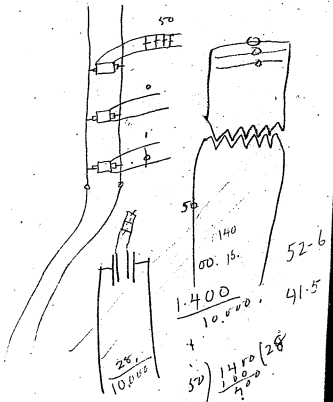
43. 20

675
43
20250

30
60
1800

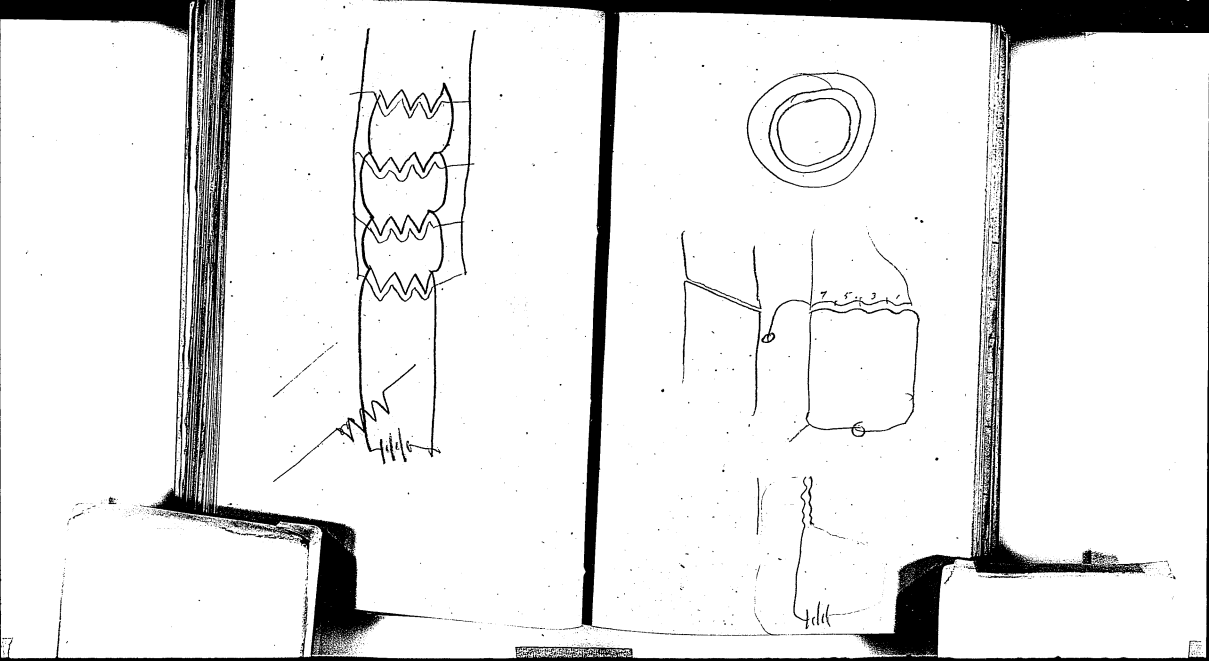
6

675
43
20250
2700
29025



1400
60. 15.
52.6
1.400
10.600.
41.5
4
50) 1400 (28
100
400

9-
16
58



Trafalgar Works Company.
Trafalgar Road, Old Kent Road, S.E. J9
London.

Edwin Richards Watts
123 Camberwell Road, S.E. J10
London.

J. Ls. Mead & Co.
92 Fetter St. E.C. J11
London.

John Nimble
169 Shadwell, High St. E. J12
London.

Alfred Holmes
76 Shacklewell Lane, E. J13
London

Henry Crouch
68 Barbican, E.C. J14
London

Aston & Mander
25 Old Compton St. W. J15
London

R. & J. Beck
68 Cornhill, E.C. 56
London.

George Bendon & Co.
36 Ely Place, E.C. 17
London.

Alexander Clarkson
28 Bartlett Building
Holborn, E.C. London. 56

John Henry Dallmeyer 19
13 Bloomsbury St. W.C.
London.

Joseph Davis & Co. 60
6 Kennington Park Road, S.E.
London.

James Deacon & Sons 61
Bayleside Southwark
London.

Clark Mairshead & Co. 17
20 E. Regency St. S.W.
Westminster, S.W.
London.

Johnson & Phillips 60
16 Upton Court.
Old Broad St., E.C. London.

Octavius Farley 60
Milkhay Ave, Wildmay St. N.
London.

E. P. & W. Baldwin 61 Est.
4 Corbet Court, Grace church
E.C. ✓ London.

~~C. H. H.~~
Cornelius, Tin Plate Co. 64
~~117 Leaden Ha~~
117 Leadenhall St. E.C.
London.

H. Erhardt & Co. 65
9 Bond Court, Wallbrook
E.C. ✓ London.

Guignon Tin Plate Co. 69
101 Leadenhall St. E.C.
London.

Shemwell and Co. 69
Bridge Road
Stratford, E. London.

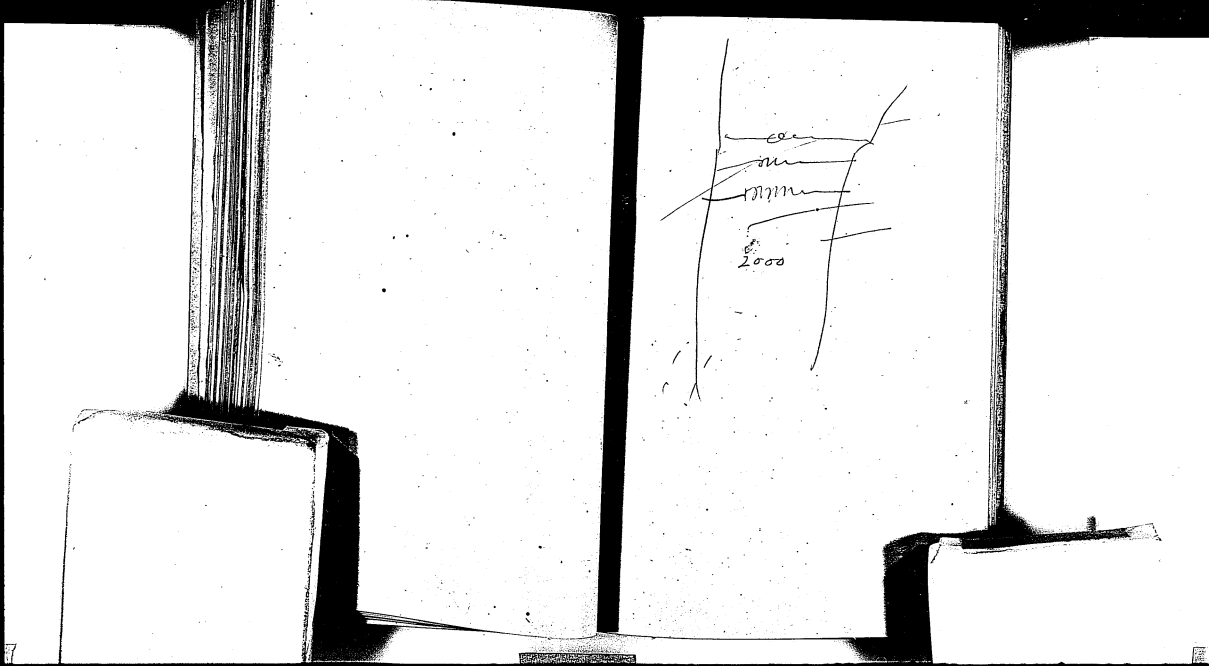
Webb, Shakespear + William
3 George Yard, Lombard
St. E. C. 70
London.

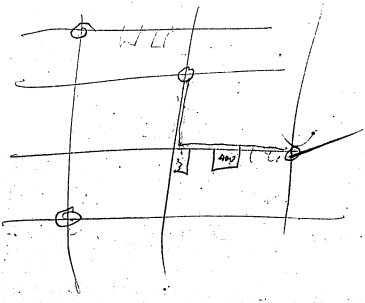
Charles Prodeham
84 Strand, W. C. 71
London.

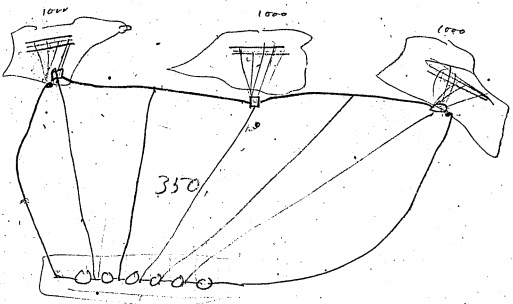
Thompson + Vine
118 Aldersgate St. E. C. 72
London

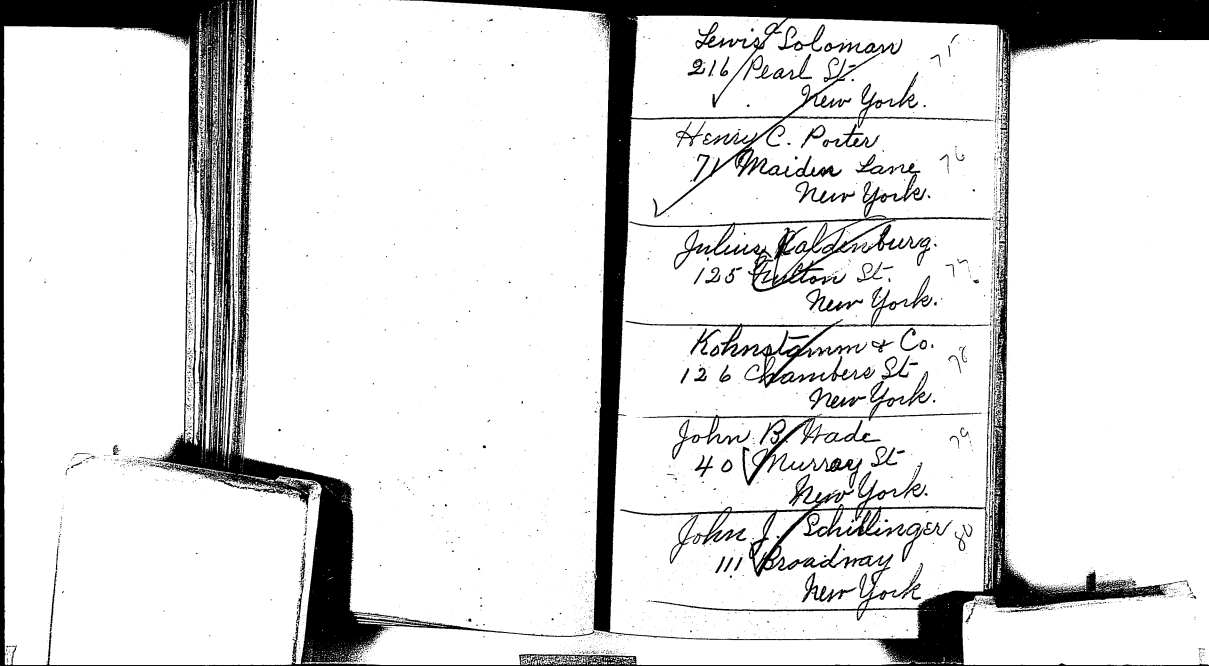
John Fletcher + Son
Booth St. 73
Salford, Manchester
Eng.

Rand Drill Co. 74
Parkpow
New York


2000




1000
1000
1000
350



Lewis & Solomon
216 Pearl St.
New York.

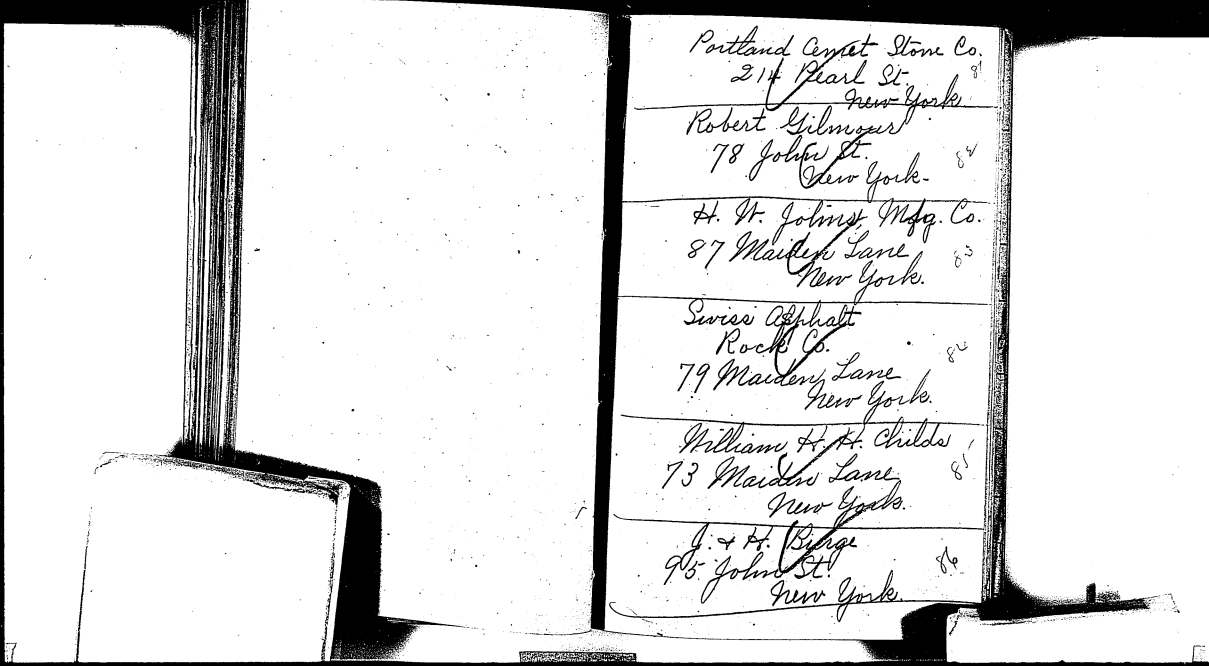
Henry C. Porter
71 Maiden Lane
New York.

Julius Kaldenburg
125 Fulton St.
New York.

Kohnstamm & Co.
126 Chambers St.
New York.

John B. Wade
40 Murray St.
New York.

John J. Schlesinger
111 Broadway
New York



Portland Cement Stone Co.
214 Pearl St.
New York

Robert Gilmour
78 John St.
New York.

H. W. Johns Mfg. Co.
87 Maiden Lane
New York.

Swiss Asphalt
Rock Co.
79 Maiden Lane
New York.

William H. H. Childs
73 Maiden Lane
New York.

J. & H. Bigg
95 John St.
New York.

Alcorn & Co.
456 Hudson St.
New York. 87

Newcomb Bros.
586 Water St.
New York. 88

New York Belting and
Packing Company
37 Park Row
New York. 89

John Dwight & Co.
11 Old Slip
New York. 90

Gantz, Jones & Co.
176 Duane St.
New York. 91

Butler & Butler
6 Great Jones St.
New York. 92

S. Oppenheimer & Co.
96 Pearl St. 93
New York.

Howard & Morse
45 Dutton St. 94
New York.

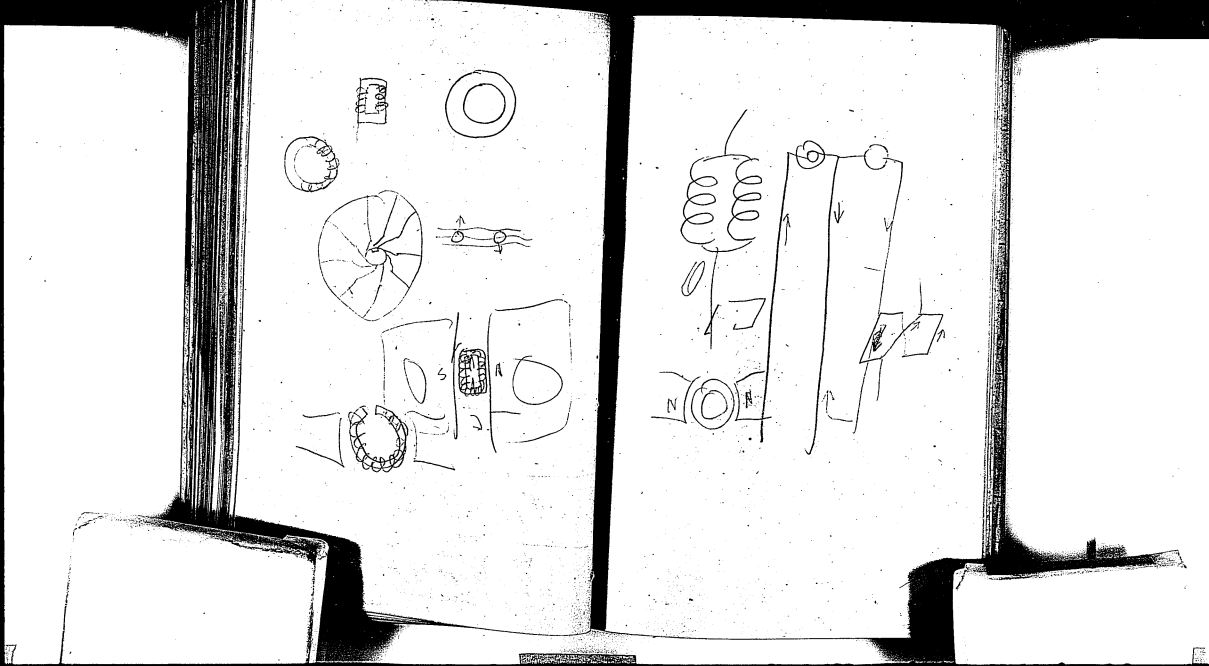
Edward A. Boyd.
79 Murray St. 91
New York.

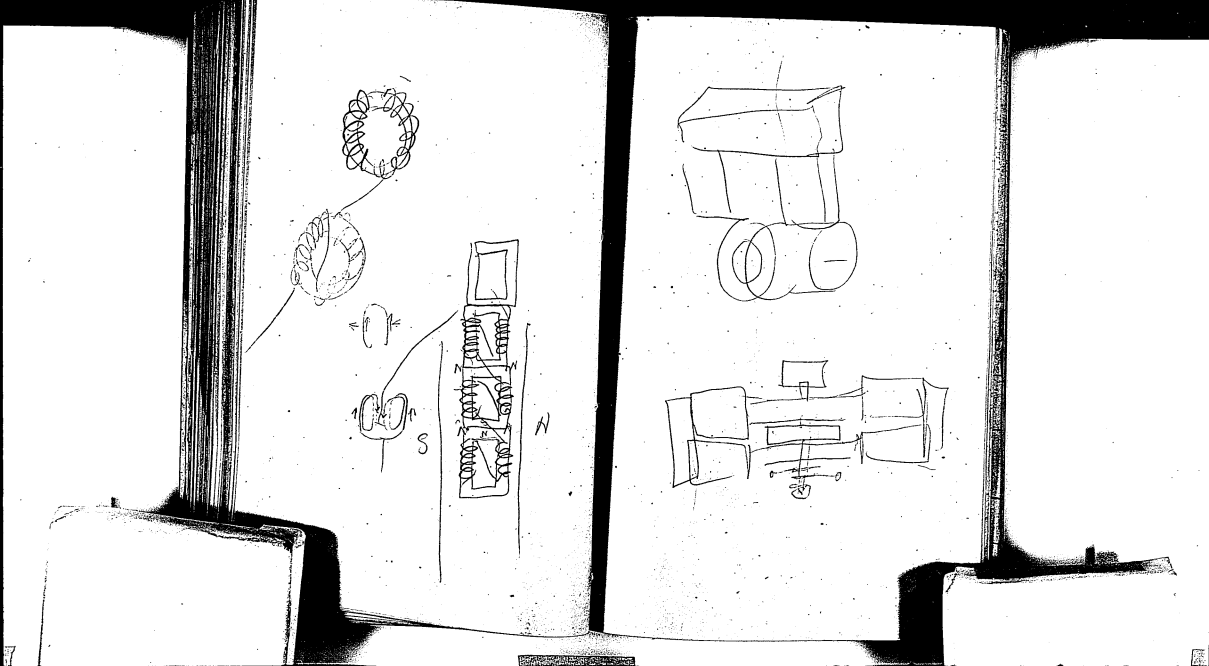
Bernhard Budde 96
50 Vesey St.
New York.

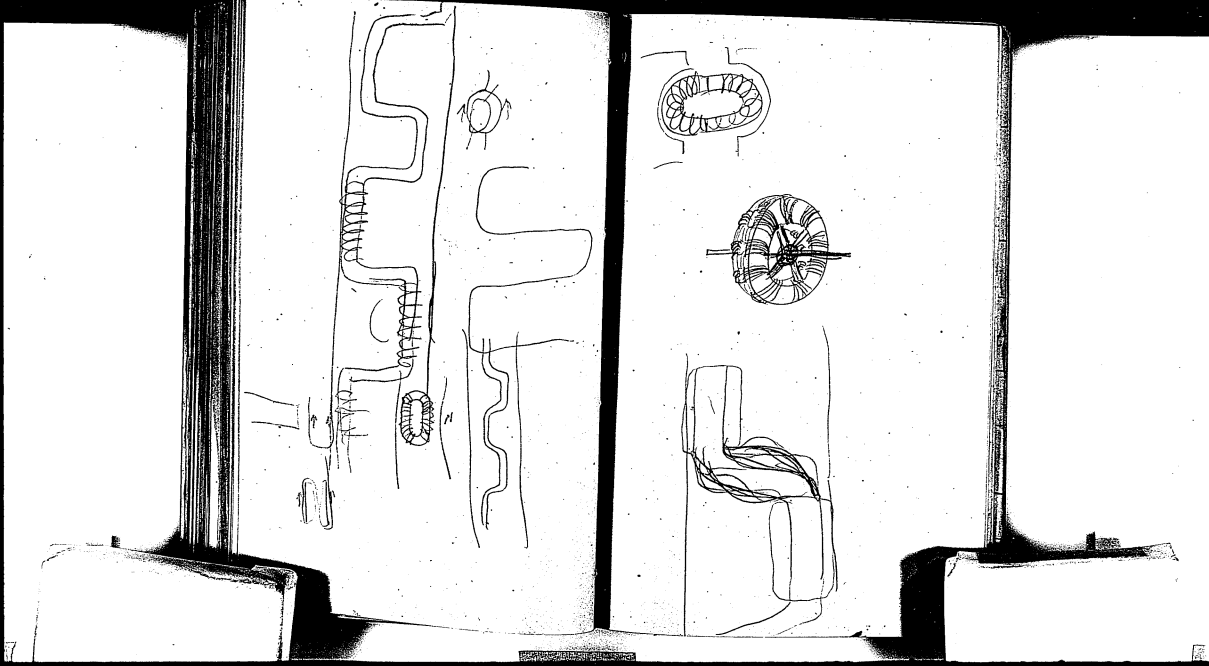
McNair & Harlin, Mfg. Co.
56 John St. 97
New York.

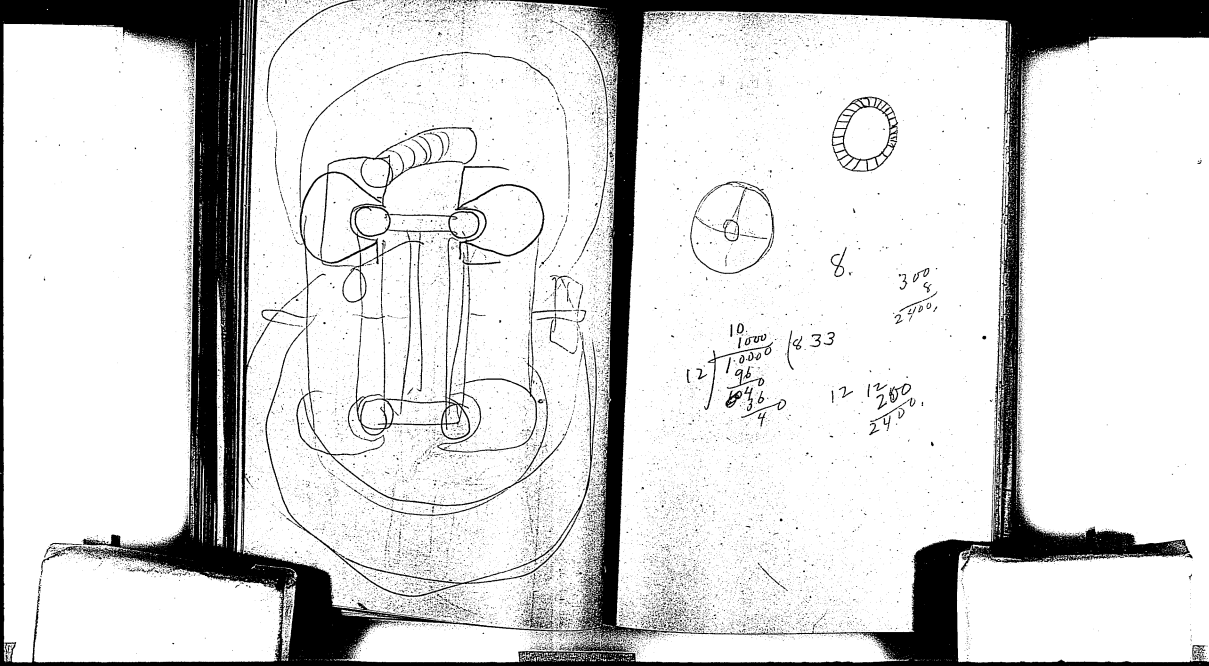
John H. Knapp. 98
17 John St. New York.

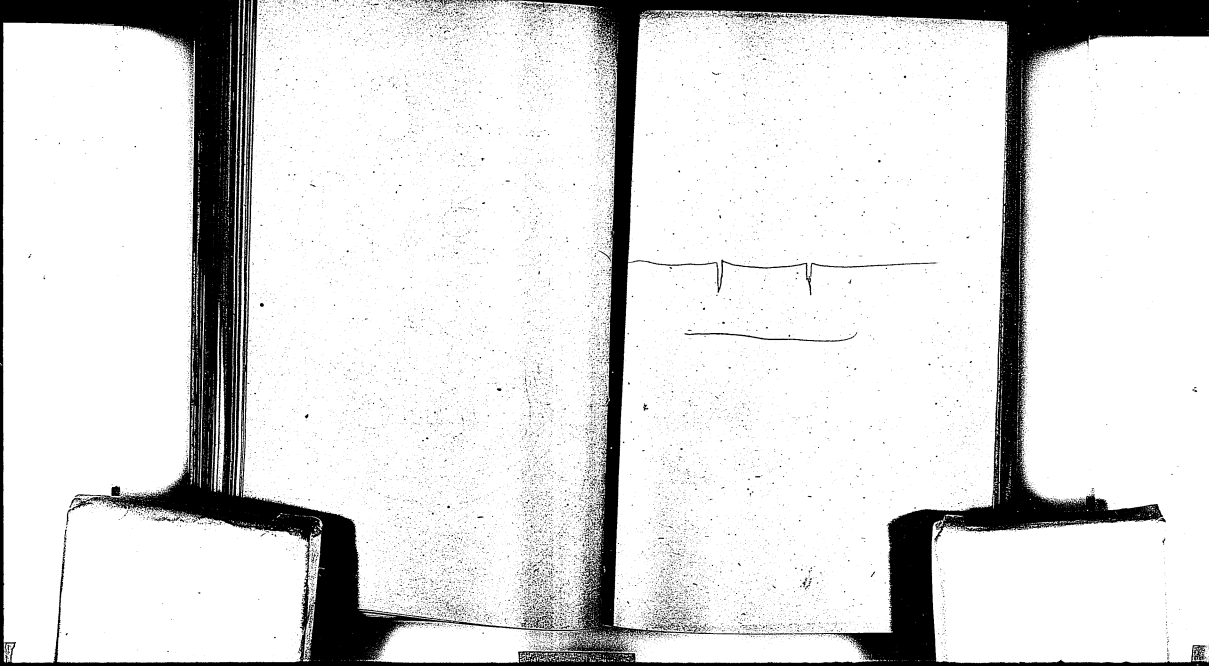
~~Howard~~
~~Wallace~~ & Sons 99
89 Chambers St.
New York


S
N
N
N


S
N




8.
300
4
2400.
10
1000
10000
12
96
40
36
4
83
12
200
2400.



Waterbury Brass Co.
296 Broadway
New York.

Edward Miller & Co
35 Stevens St
New York.

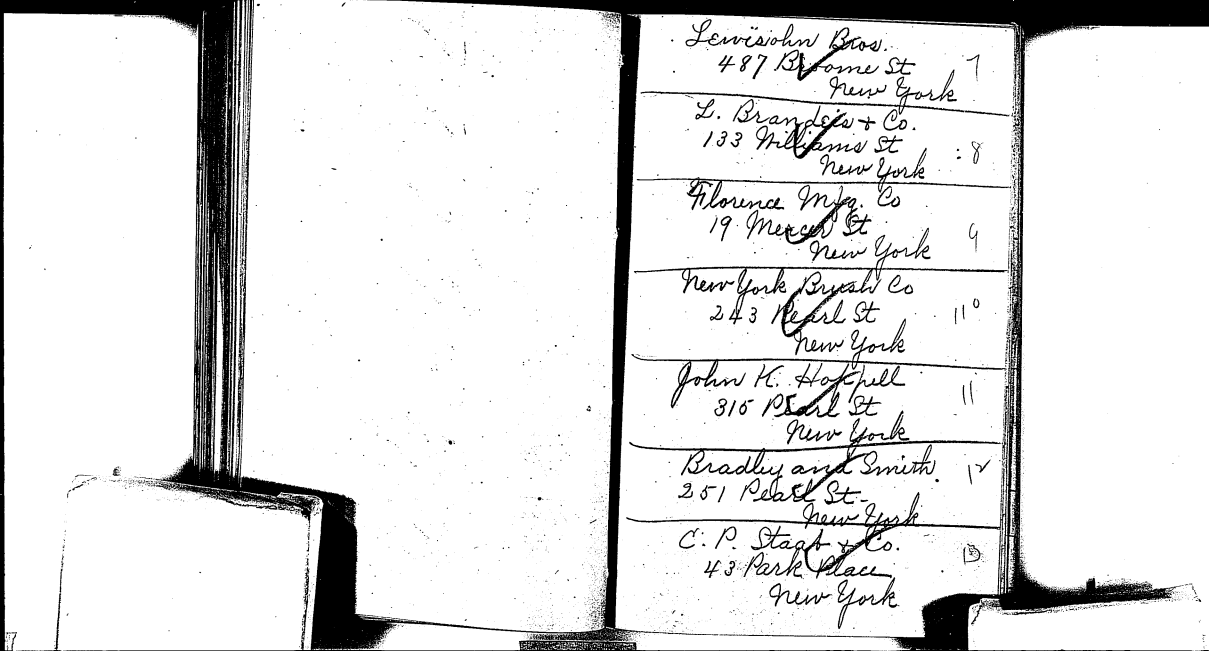
Plume & Atwood Mfg. Co.
18 Murray St
New York

Brown and Bros
81 Chambers St
New York

Holmes and Griggs, Mfg. Co.
63 Dutch St
New York.

Steele and Johnson, Mfg. Co.
78 Reade St
New York

William Guillaw
409 Pearl St
New York


Lewisohn Bros.
487 Broome St
New York
7
L. Brandeis + Co.
133 Williams St
New York
8
Florence Mfg. Co
19 Mercer St
New York
9
New York Brush Co
243 Pearl St
New York
10
John K. Hoffell
315 Pearl St
New York
11
Bradley and Smith
251 Pearl St.
New York
12
C. P. Stagg + Co.
43 Park Place
New York
13

Butler and Hunting 15
53 Dey St.
New York

P. & F. Corbin 11
87 Chambers St
New York

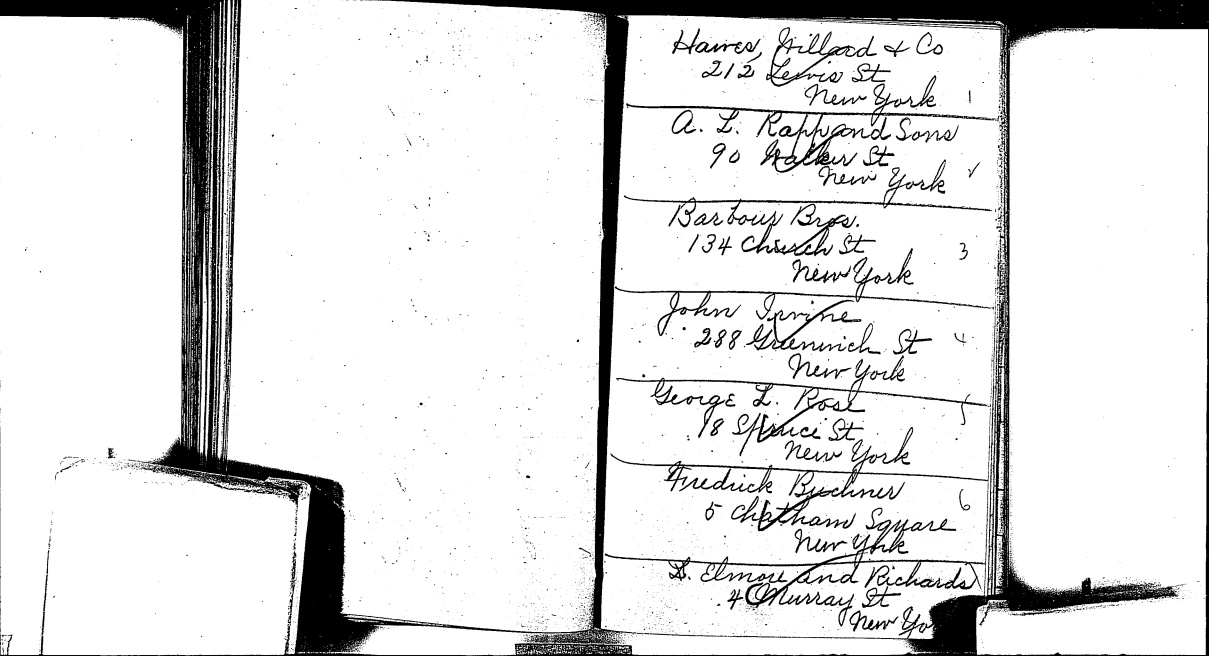
Huguenin Mfg. Co. 16
186 Chambers St
New York

Williams, White and Churchill 17
55 Harrison St
New York

Fechtman and Glade 18
205 Canal St
New York

Hammacher and Co. 19
209 Bowery
New York

J. Capcutt, Sons & Co. 20
440 Washington St
New York



Haines, Gillard & Co
212 Lewis St
New York 1

A. L. Rappand Sons
90 Walker St
New York 2

Barbour Bros.
134 Church St
New York 3

John Irvine
288 Greenwich St
New York 4

George L. Rose
18 Spruce St
New York 5

Friedrick Bychner
6 Chatham Square
New York 6

S. Elmore and Richards
4 Murray St
New York

Lewis K. Bell
56 Pine St
New York 8

James R. Dey
66 Courtlandt St
New York 9

Edward L. Embree
184 Front St
New York 130

H. N. Everett + Co
85 William St
New York 1

Alexander Fixies & Bros.
16 College Place
New York V

Edward C. Gilfeather
62 Fulton St
New York 3

William Goldstein
450 Cherry St
New York. 4

Otto Hanor
7 Burling St. Successor to
Louis Polk Amy. New York

Harrison Bros & Co.
163 Fulton St. N. Y.

G. W. Hubbard & Co.
55 Pine St., N. Y.

Kalbfleisch, Martin, Sons,
55 Fulton St, N. Y.

James Lee & Co.
72 Pine St., N. Y.

Lodi Chemical Works
22 Platt St., N. Y.

Manhattan Chemical Co.
129 Water St., N. Y.

Maynard Chemical Co.
424 Washington St, N.Y.

James Meyer jr.
48 Park St., N. Y.

R. G. Mitchell & Co.
141 Water St.
N. Y.

James L. Morgan & Co.
47 Fulton St., N. Y.

N. Y. Chemical Mfg. Co.
3 E. 4th St. N. Y.

N. Y. Dye Wood Extract and Chemical Company.
161 Front St., N. Y.

G. H. Nichols & Co.
99 Maiden Lane, N. Y.

H. Osgood & Co.
13 Burling St. N. Y.
Agents for the Bergenport Chemical Company

Page, Kidder & Fletcher
10 Warren St., N. Y.

John Bellet & Bro.
240 Pearl St., N. Y.

William Pickhardt & Kuttroff
98 Liberty St.
N. Y.

Pugh & Nudge
263 Front St., N

Lewis H. Rogers.
230 E 61st St., N. Y.

Charles H. Rutherford
26 Liberty St. N. Y.

Henry Snyder
84 Nassau St. N. Y.

Walter C. Tiffany
150 Nassau, N. Y.

Fred. ~~Toussaint~~ Toussaint
Mott Ave. c. 144th St., N.

William H. Trippe
87 Walker St. N. Y.

Trescher & Hall
96 Wall St., N. Y.

Walton Chemical Co.
205 Prince St., N. Y.

George E. White
169 Front St., N. Y.

Edward M. Willet
549 W. 84th St. N. Y.

Wing & Evans
93 William St. N.

E. J. Beggs & Co 5
147 Maiden Lane, N. Y.

Billings, Clapp & Co. 6
Maiden Lane, N. Y.

George Binns 7
5 Gold St. N. Y.

Bloede and Rathbone
5 Cedar St. N. Y.

Frank Crosby 9
66 Sixth Ave, N. Y.

John H. Cussy 10
20 E. 29th St., N. Y.

Dibblee and Co. 1
132 Broy, N. Y.

Dieckes & Forster 2
15 Spruce St., N. Y.

John C. Draper 3
4 Lexington Ave, N. Y.

J. G. Dreyfus Dreyfus & Co. 4
15 Cedar St., N. Y.

Henry Edgar 5
629 Hudson St., N. Y.

Erdensohn Chemical Co.
120 Liberty St., N. Y.

John Erkenbrach
34 Platt St., N. Y.

L. Feuchtwanger & Co.
16 Dey St. N. Y.

William E. Gladstone
1337 Bwy, N. Y.

Frederick H. Hecking
281 Pearl St., N. Y.

Hiscox & Co.
165 William St., N. Y.

Augustus Hurd
32 New Church St., N. Y.

Henry F. Jarrett
166 Ave. C., N. Y.

Martin Kalbfleisch's Sons
55 Fulton St., N. Y.

B. Keith & Co.
4 Liberty St., N. Y.

King and Hunt
197 Pearl St., N. Y.

Picture frames,
Fans,
Buttons,
Clock Cases,
Decorating,
~~Cable~~
Pottery, platina foil
Tile,
Brilliana ware,
Watch Cases,
Combs

Charles H. Kraft.
18 Exchange Place, N.Y.

D. Langley's Son & Co.
8 Cooper Union, N. Y.

John E. Lauer
174 Pearl St, N. Y.

Hypolite Lefrasseur
587 G'wich, N. Y.

Mass Schleicher & Co.
6 Gold St. N. Y.

James Meyer Jr.
87 Broad & 48 Nassau St. N.Y.

J. G. Milne & Co.
70 New Church St. N.Y.

Fred. C. Musgglller
195 Duane St., N.Y.

Fred Oakes. 34 Dey St, N. Y.

Charles C. Parsons
542 & 20 1/2 & 34 Pine St.
N.Y.

J. C. + D. Pennington
5 Williams St. N. Y.

Charles H. Phillips
2 Platt St. N. Y.

Lawrence P. Piercy
62 Church St. N.Y.

Porter, Stanley & Co.
155 Bowery St. N. Y.

Reed and Carnrick
196 Fulton St. N.Y.

Scott + Bowne
125 Hudson St., N. Y.

George H. Smith & Co.
156 Maiden Lane, N.Y.

Tilden & Co.
24 Liberty St., N. Y.

Townsend, Wilson & Co.
38 Murray St., N.Y.

Urban Adolphi
497 Tenth Ave, N.Y.

James E. Walker + Co.
5 Rector St. N. Y.

William R. Warner + Co. 208
33 John St., N. Y.

Charles T. White + Co. 209
54 Maiden Lane + 29 Liberty St.
N. Y.

D. Dour-Williamson 210
1 College Place, N. Y.

Winchester + Co. 211
36 John St., N. Y.

Isaac G. Wyman 212
142 Horatio St. N. Y.

Hammill + Gillespie 213
240 + 242 Front St., N. Y.

William Anderson 214
54 Barclay St., N. Y.

E. Cauldwell's Son 215
76 Warren St.

Oscar Cheirman 216
74 Harsen St., N. Y.

E. T. Conklin
73 Murray St., N. Y.

Crystal Glass Co.
44 Murray St., N. Y.

Dureen Bros.
50 Maiden Lane, N. Y.

Christian Goepfert
2331 Third Ave., N. Y.

Geo. A. Hammond
144 E. Bway, N. Y.

John Leach
60 Barclay St., N. Y.

~~Theodore Lost~~ ~~Discount~~
Theodore Higgins
180 E. Houston St., N. Y.

William H. Wilson
38 Jersey St., N. Y.

James H. Wiseman
85 Warren St., N. Y.

George H. Woodward
42 Murray St., N. Y.

John Bliss & Co.
110 Wall St., N. Y.

D. Eggerts Sons
74 Wall St. N. Y.

Samuel Hammond
41 William, opp. Custom H
N. Y.

T. S. & J. D. Negus
146 Water St., N. Y.

John Pettit & Bro.
240 Pearl St., N. Y.

M. Gabriel
205 Pearl St., N. Y.

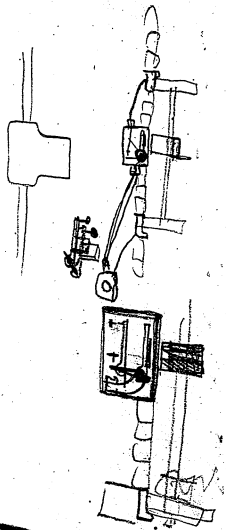
Guy C. Hotchkiss Guild & Co.
624 E. 14th St., N. Y.

Charles E. Tittle
59 Hutton St., N. Y.

Hendricks Bros.
49 Cliff St., N. Y.

A. C. Keeney & Clarke
54 Cliff St., N. Y.

New Haven Copper Co.
205 Pearl St., N.



Bridgewater Iron Co.
73 Pearl St., N.Y.

T. Shriver & Co.
333 E. 56 St., N.Y.

D. Allen's Sons
166 Front St., N.Y.

Cable Flax Mills
113 South St., N.Y.

Louis C. Glover
29 Cliff and 245 Pearl St., N.Y.

A. H. Hart & Co.
90 White St., N.Y.

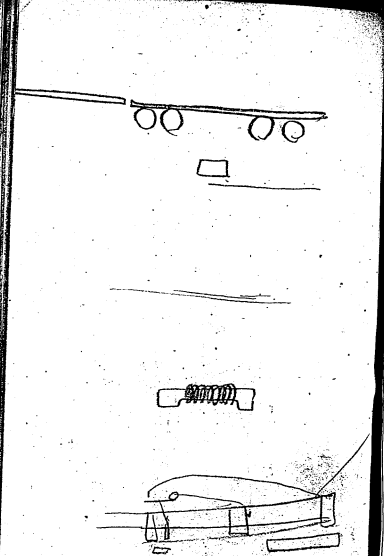
Williams Walls Sons
113 Wall and 4 Jones La., N.Y.

Lawrence Waterbury & Co.
136 Front St., N.Y.

Augustus Collet & Co.
E. 20th St + Bway., N.Y.

Charles Fleickert
37 Greene St., N.Y.

John Henry Vogt
1211 B'way, N.Y.



J. E. & L. E. Baldwin
45 Fulton St., N.Y.

William H. Godfrey
51 Fulton St., N.Y.

N. Y. Cork Cutting Co.
45 Fulton St., N.Y.

Boera & Co.
1101 Maiden Lane, N.Y.

William King & Co.
1372 Maiden La., N.Y.

Marshall Lefferts
96 Beekman & 495 Cherry St.
N.Y.

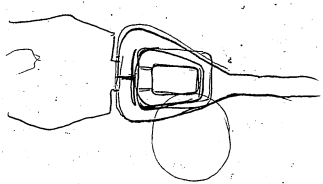
Brinckerhoff, Turner & Co.
109 Duane St., N.Y.

William P. Atkinson
97 Pearl & 108 Morton St.
N.Y.

Am. Graphite Co.
24 Cliff St., N.Y.

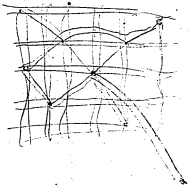
J. Goebel & Co.
189 Maiden La., N.Y.

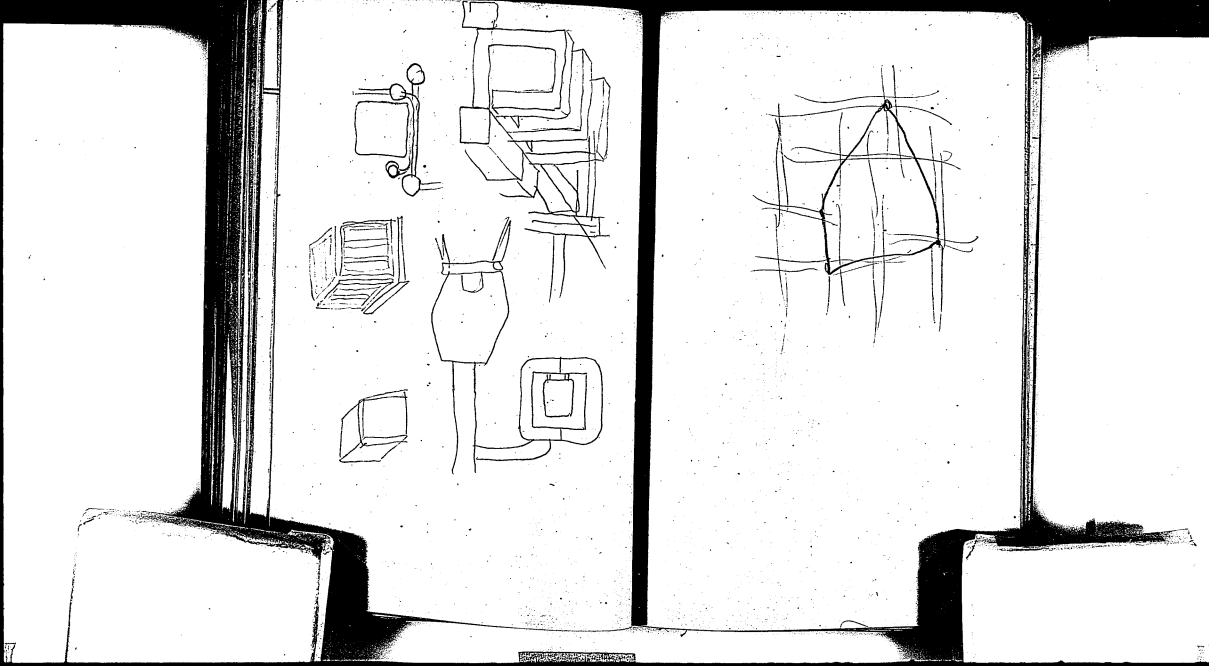
John Biddle
207 Centre St., N.Y.

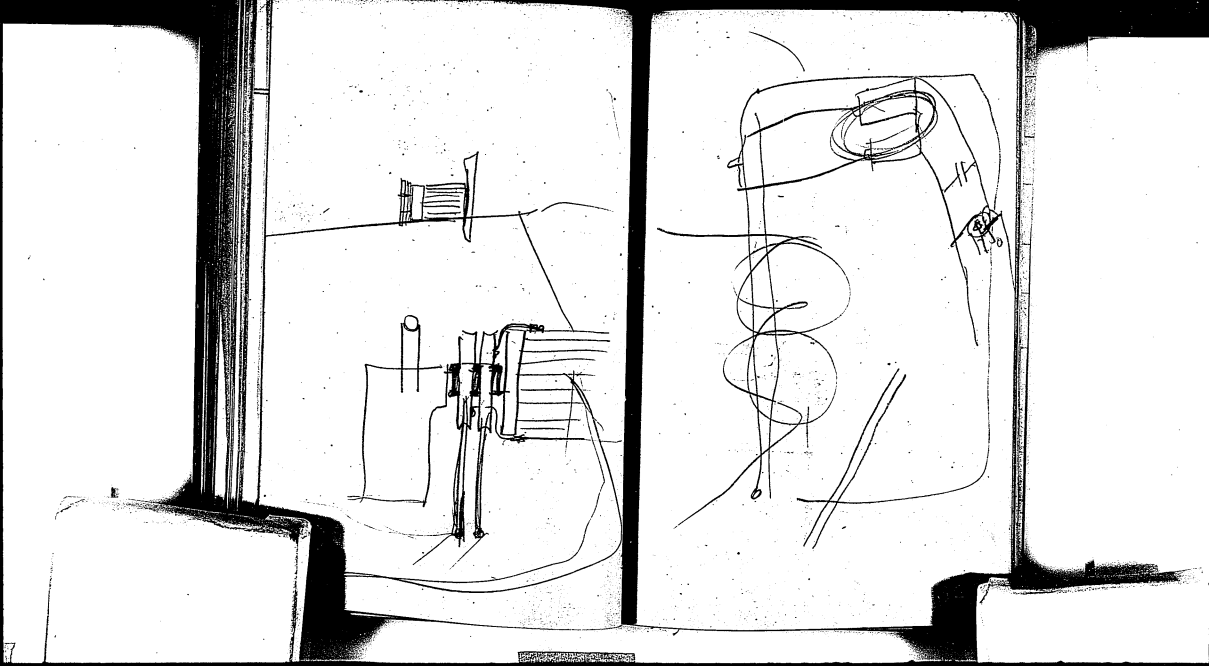


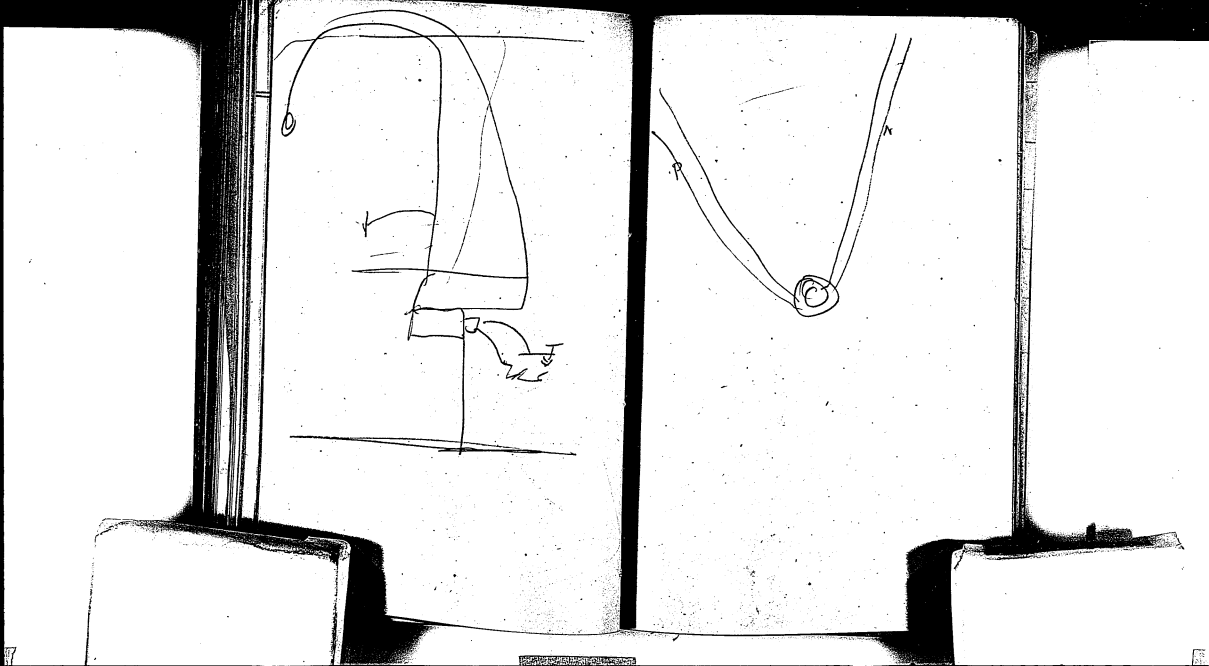
Light

An armature inductive of the direction of the electric current. The lines of force of the field. Whatever the direction of the primary current, the induced current in the armature is always in the opposite direction.









Philip Schmidt
41 Greene St., N. Y.

Johnston Bros.
1260 B'way, N. Y.

Samuel S. White
767, 769 and 1300 B'way, N. Y.

John Backus
146 Cherry St., N. Y.

Cramptons Bros.
6 Rutgers Pl., N. Y.

R. Hoe & Co.
504 Grand St., N. Y.

Mineralized Rubber Co.
22 Platt St., N. Y.

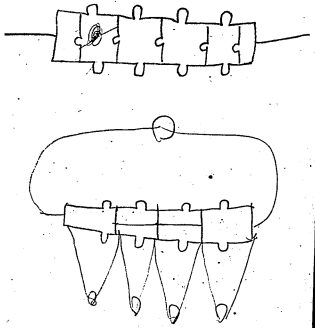
Edmonds & Benton
270 West St., N. Y.

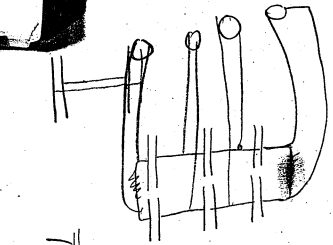
John Sellers & Son
9 & John St., N. Y.

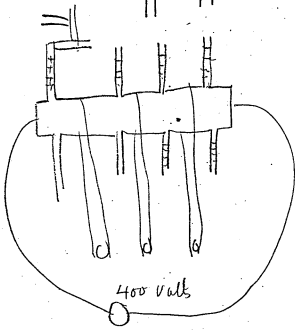
Williams Ruskin's Sons
74 William St., N. Y.

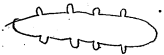
Tyler and Finch
54 Cedar St., N. Y.

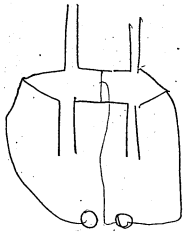
Cary & Morgan
284 W. 29½ St. N. Y.

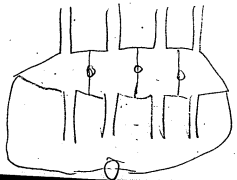

earth

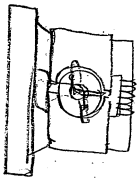



400 Volts









60/1500
12.0.0
3.0.0
2.5-

Bogarts Patents
41 Union Sq. S. N. Co.
17th St. N.Y.

Bennetto Brothers
91 Walker St., N.Y.

Boston + Sandwich Glass Co.
21 Barclay + 26 Park Pl. N.Y.

Hagerty Bros. & Co.
10 Platt St. N.Y.

D. F. Tiemann + Co.
16 Murray + 19 Park Pl. N.Y.

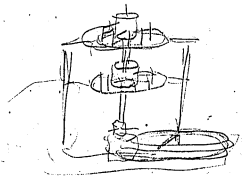
E. Steiger 25 Park Pl., N.Y.

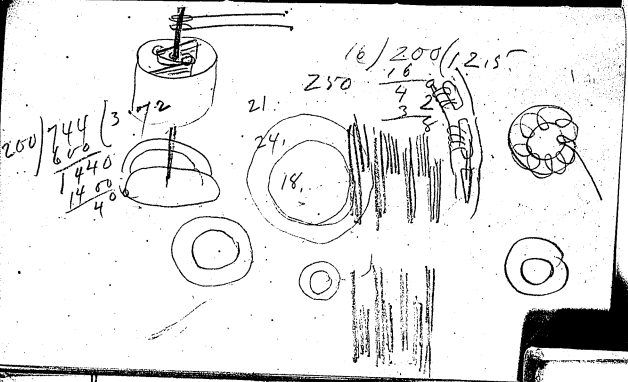
E.R. Durkee + Co.
135 Water St., N.Y.

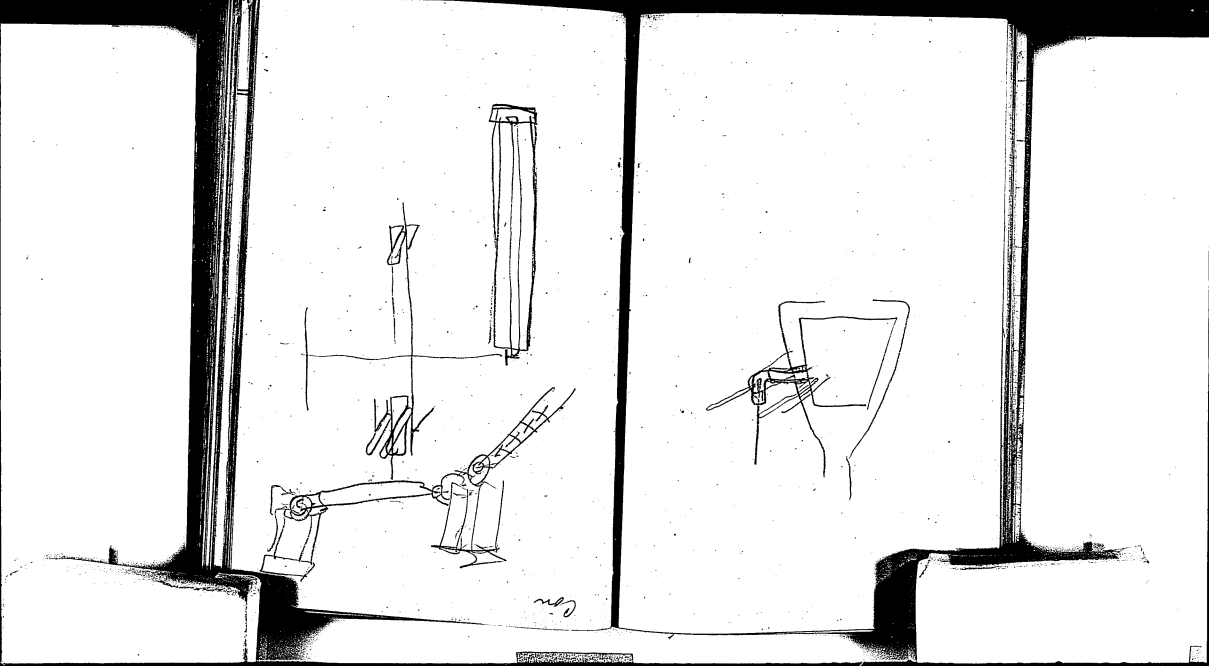
~~Gillespie~~
Louis C. Gillespie
8 Fletcher St, N.Y.

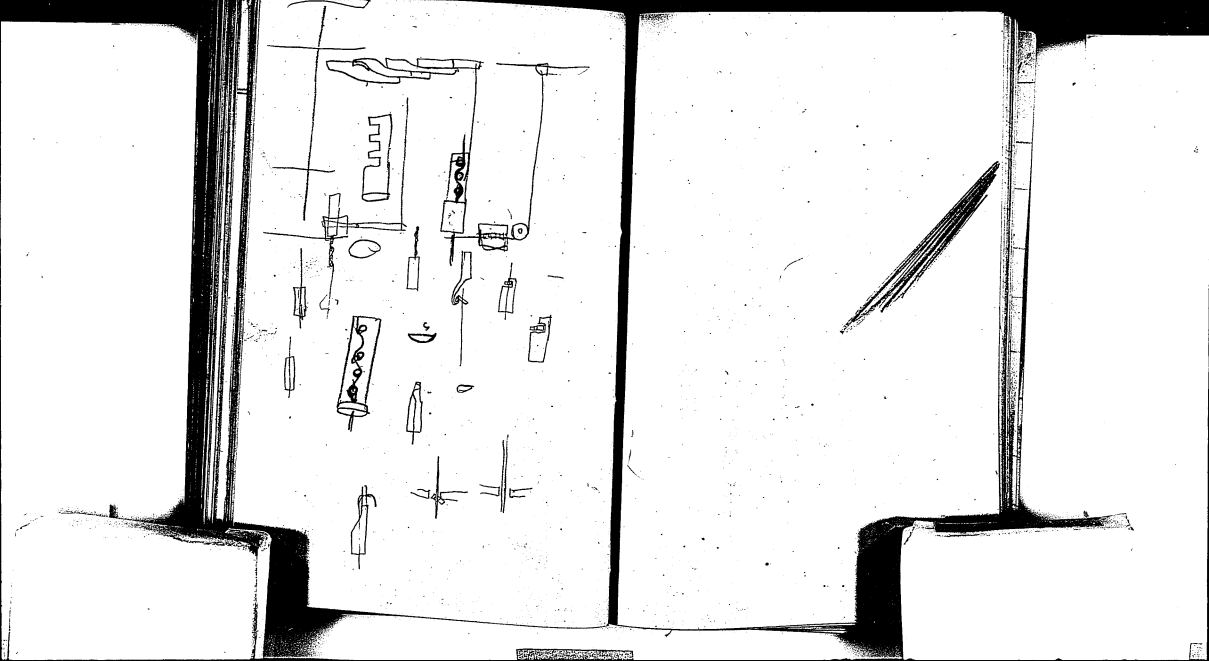
John S. Samson + Bro.
77 Maiden La., N.Y.

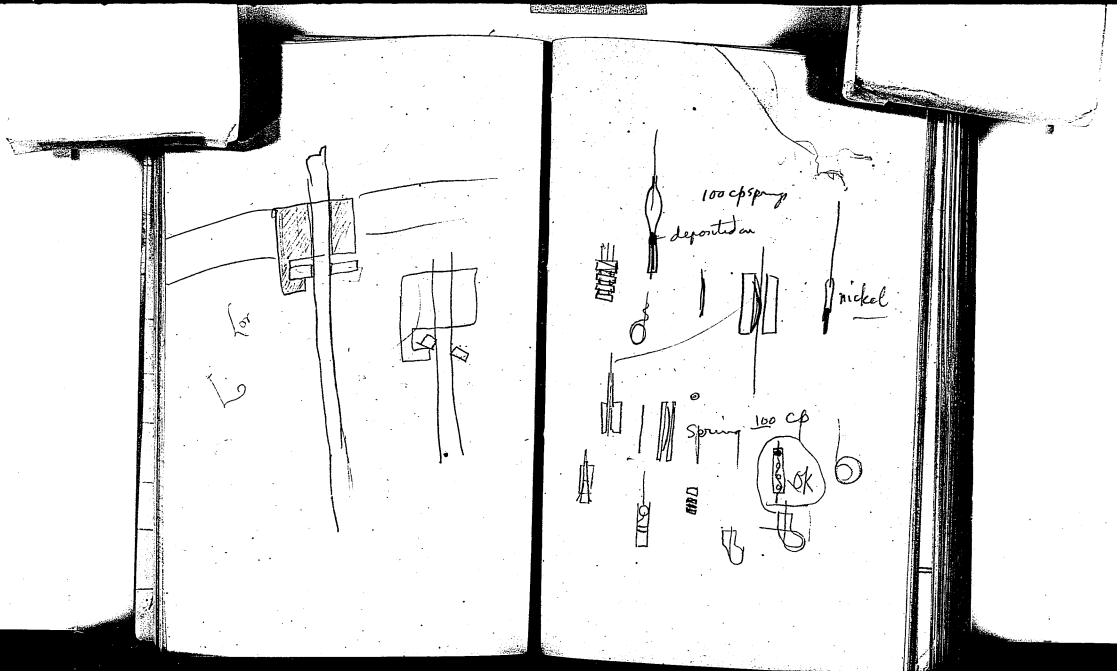
Louis A. Salomon
216 Pearl St., N

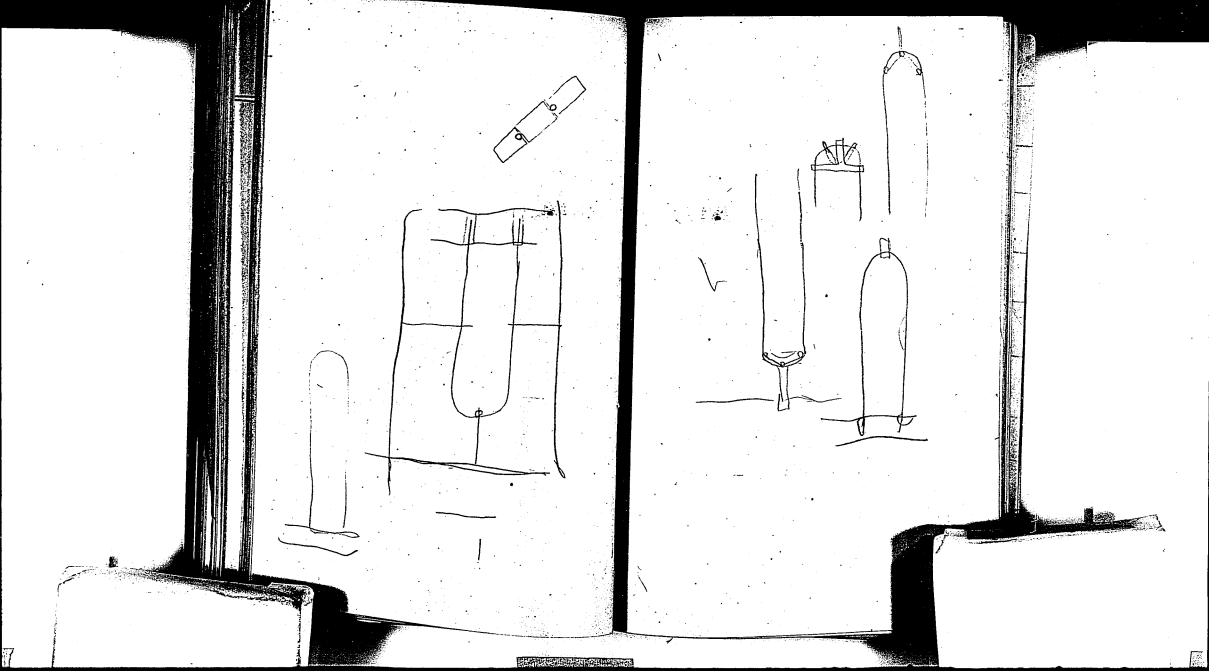


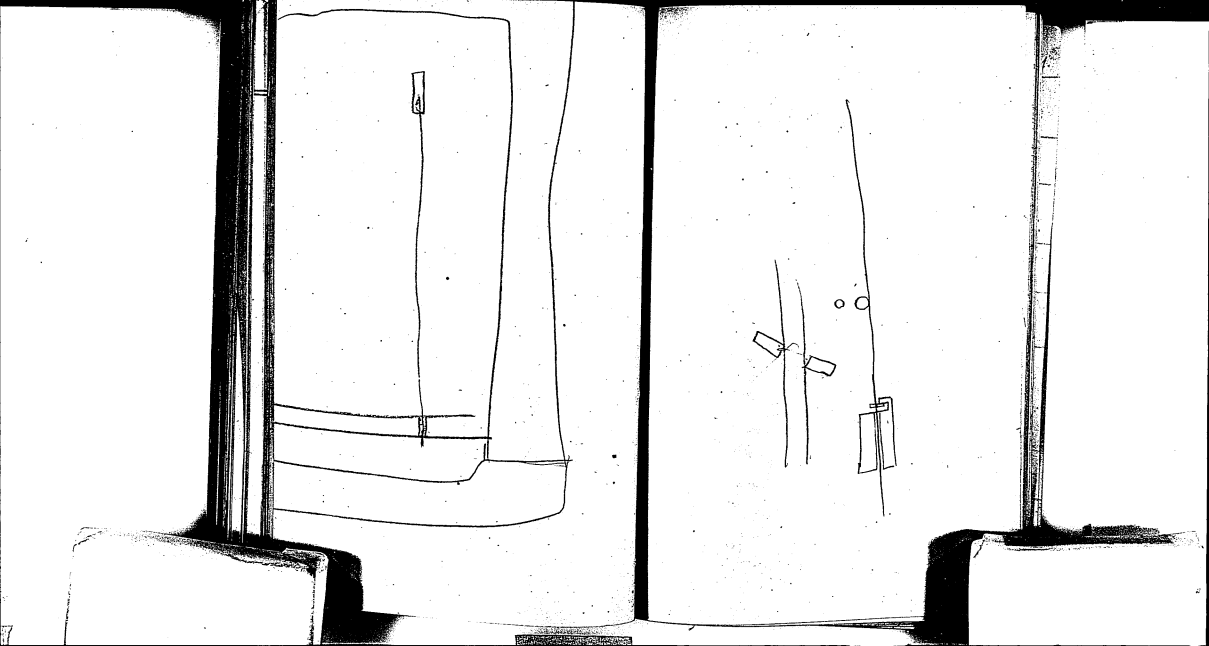

200) 744 (3
600
1440
1440
0
72
21
24
18
16) 200 (12.5
16
40
32
80
80
0
250

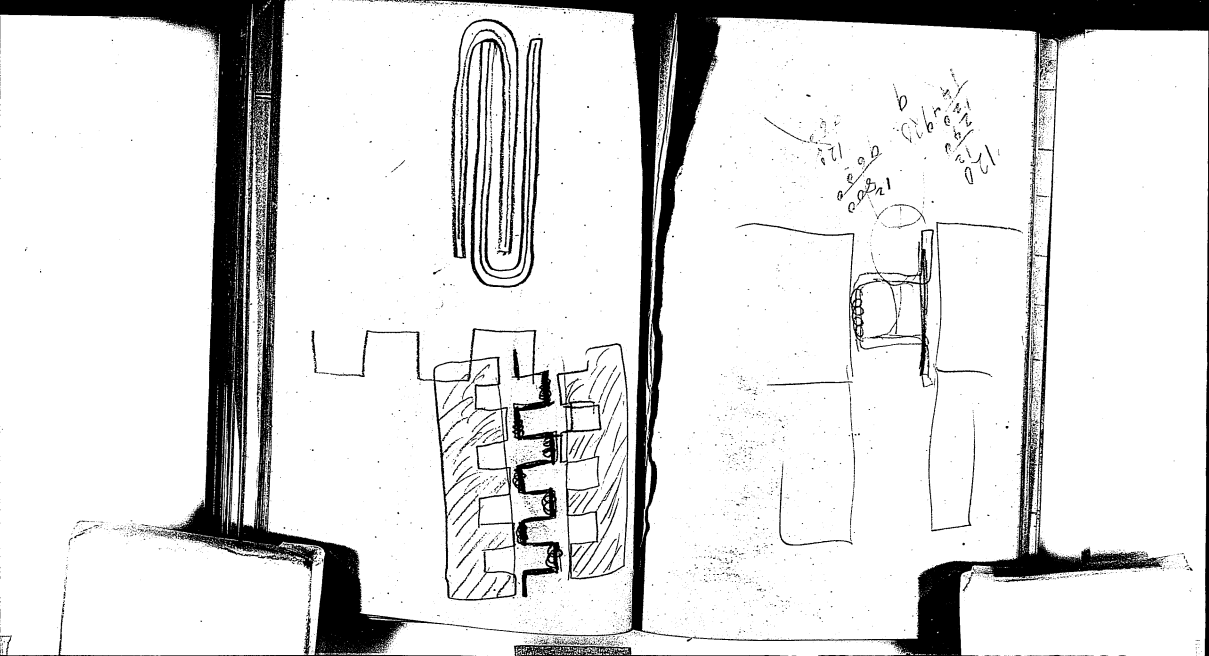


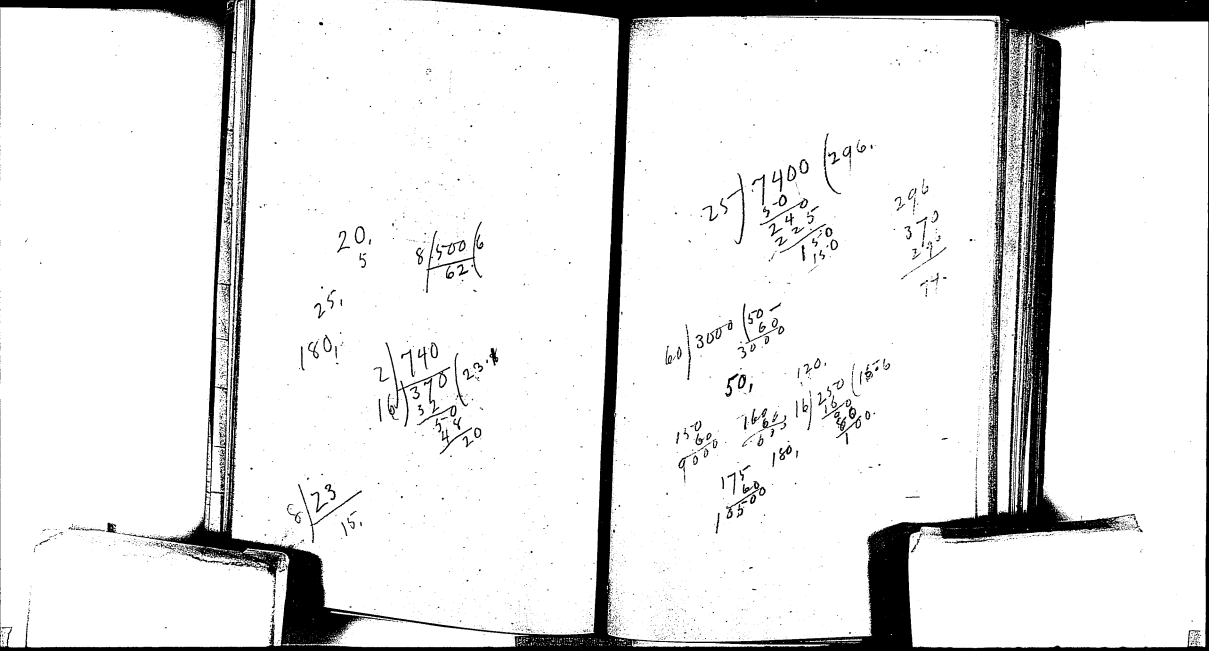


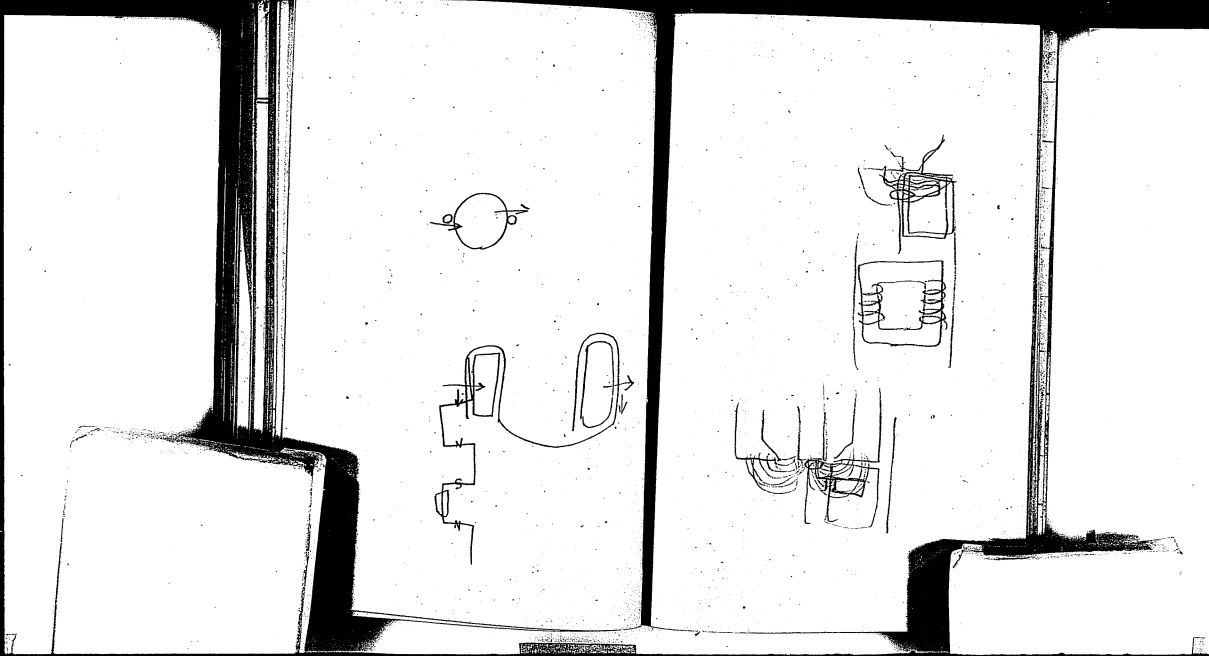

100 cps spring
deposition
nickel
Spring 100 cps
OK

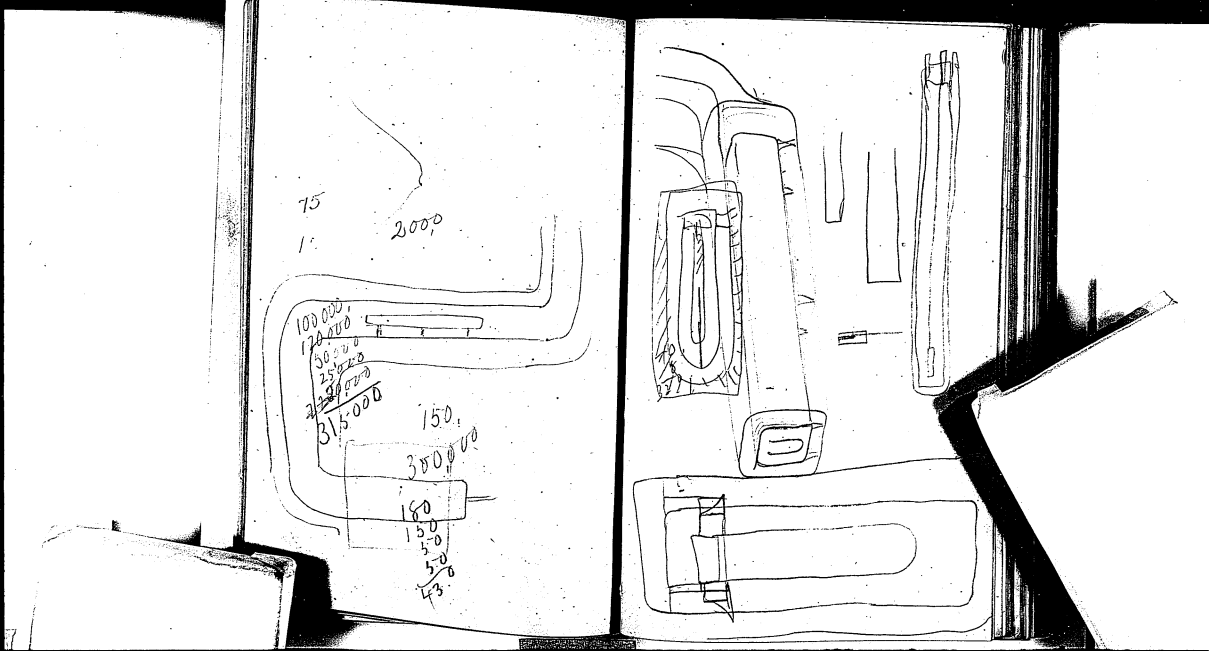


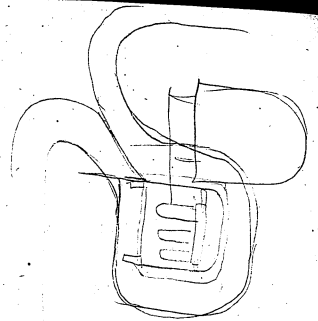





20.
5
8/500/6
62
25.
180.
2/740
16/370/23.
32
50
48
20
6/23
15.
25/7400/296.
50
225
150
150
296
370
243
127
60/3000/50
300
50.
120.
150
1600
900
16/2520/157.6
160
80
80
160.
175
600
1550


S
N


75
2000
100,000
120,000
50,000
25,000
315,000
150
300000
150
150
50
50
43



Sarah Bishop
42 & 44 25th St., N.Y.

Alexander King + Co.
54 Leonard., N.Y.

Benj. Fox 250 Water St., N.Y.

Pocasset Iron Works
9 Cliff St., N.Y.

William T. Wells
78 Beekman St., N.Y.

C. H. May, Fernbaker + Co.
63 Pearl St., N.Y.

Brown Calfric Engine Co.
67 Lewis St., N.Y.

A. E. Roper Sherrill Co.
91 Washington St., N.Y.

E. Lyon + Co.
470 Grand St., N.Y.

Etienne Gillet
10 Courtlandt St., N.Y.

Composite Iron Works Co.
133 Mercer St., N. Y.

Otto Gerdau
41 Dey St., N. Y.

F. Grote & Co.
114 E. 14th St. N. Y.

R. Isaacs & Brother
627 B'way, N. Y.

Millard F. Barden
60 Lawn St. N. Y.

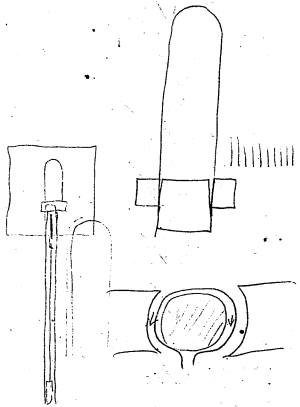
Joseph H. Binsley
20 Cortlandt St. N.Y.

Carbon Black Co.
42 John St., N. Y.

H. Kohnstamm & Co.
126 Chambers St., N.Y.

John L. Caldy
61 Beekman St. N. Y.

Colwell Lead Co.
28 Centre, & 24 Pearl,
1416 B'way, N. Y.



N. Y. Smelting + Refining Co.
181 Jane St. N. Y.

Nathan + Bros.
82 Beekman + 135 N. 30th
New York

Anton Heinz
363 Henry + n 225 E. 36th St.
N. Y.

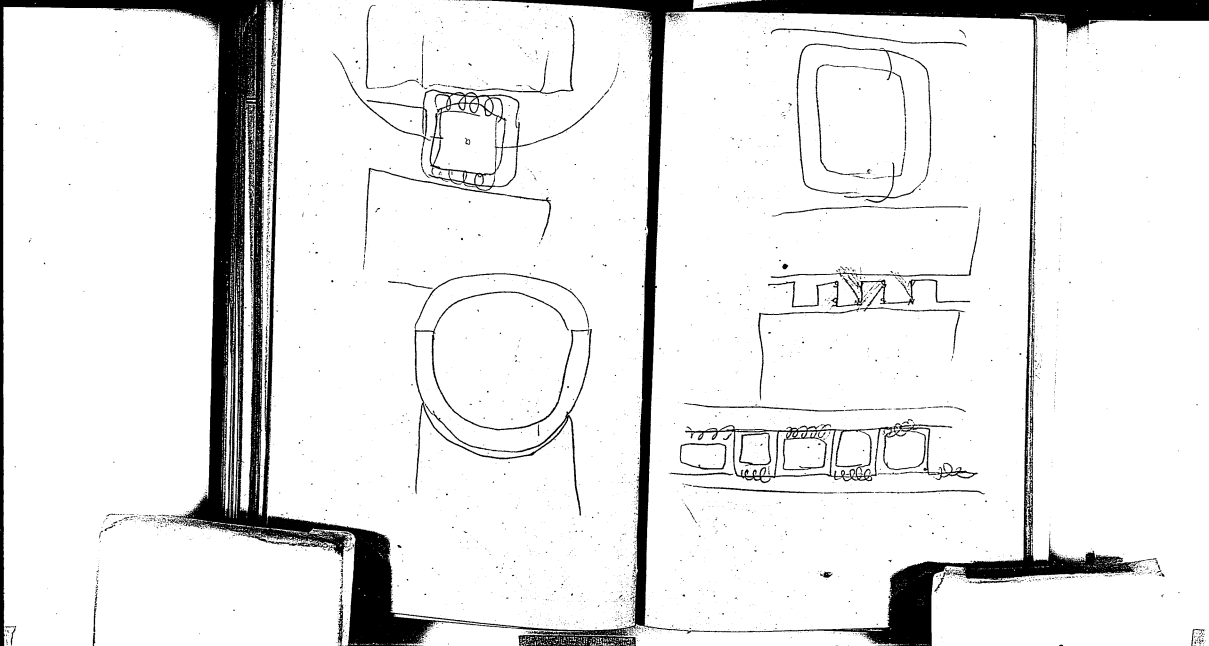
J. B. Hoyt + Co.
28 Spruce, 212 Eldridge +
Mt. E. 44th St. N. Y.

Reuben Smith
4 Fourth Ave., N. Y.

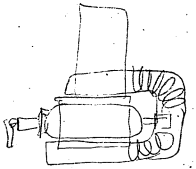
Am. Linoleum Mfg. Co.
Rid Richmond, S. I.
Agents. Joseph Wild + Co.
90 + 92 Thomas St. N. Y.

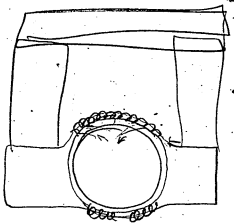
Victor E. Granger + Pirtsie
110 Reade St. N. Y.

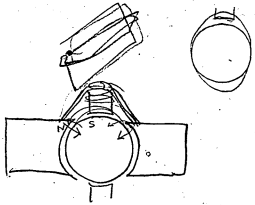
Henry Gaspar
193 William St. N. Y.

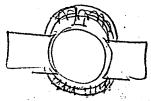


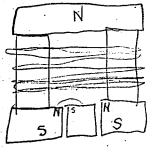
100 V. 1 amp

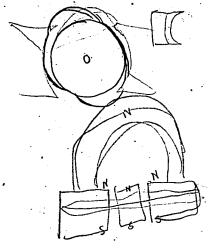


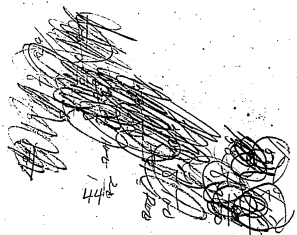







N
S
N
S
N
S


N
N
N
S
S
S

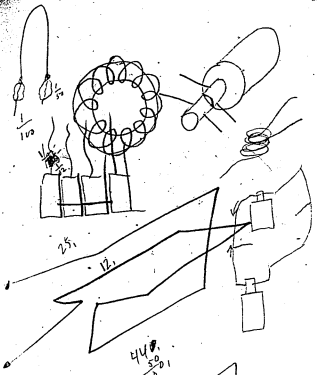


4400
50
220,000

1.4
.7
.35

1/100 50

1/5000

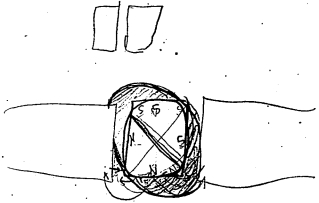


44
5000
220000

44
50
2201

1 amp 1 ohm

50.



Mayer, Merkell, & Ottmann
23 Warren St. N.Y.

Stephen R. Krom
21 Liberty St. N.Y.

Alexander Maxwell
176 B'way & Fourth Ave. n. 138th St. N.Y.

Oscar G. Aldstrom
162 Williams St., N.Y.

John J. Barry
90 Fulton St. N.Y.

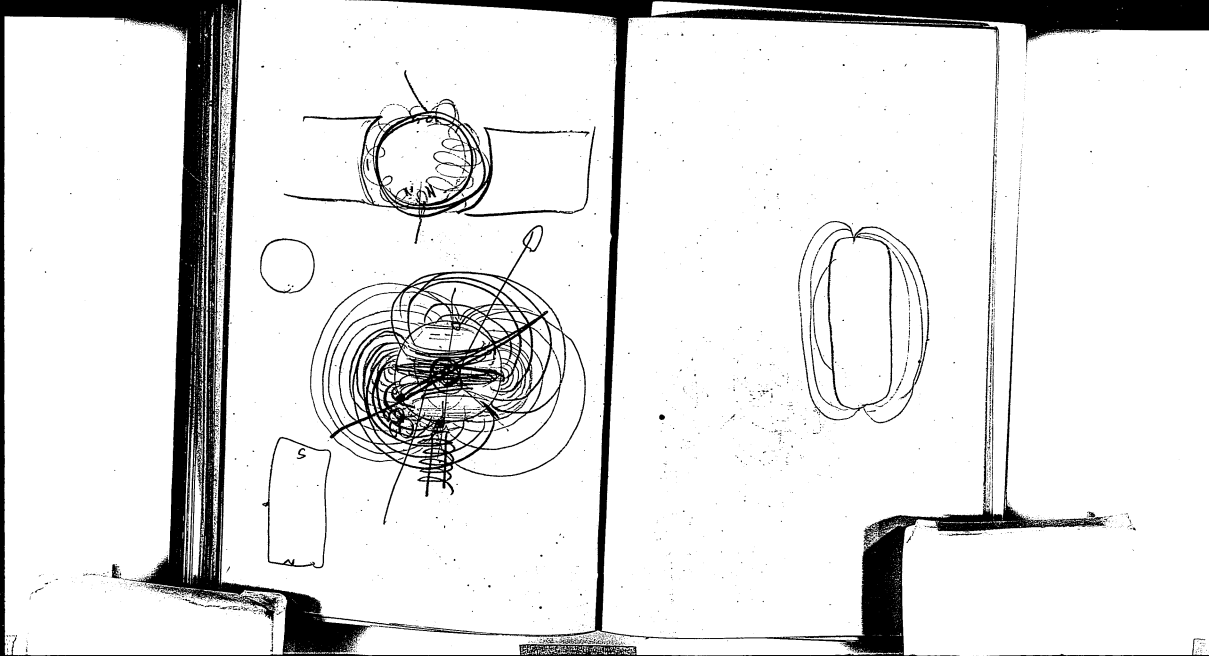
Adolph Bayer
69 Fulton St. N.Y.

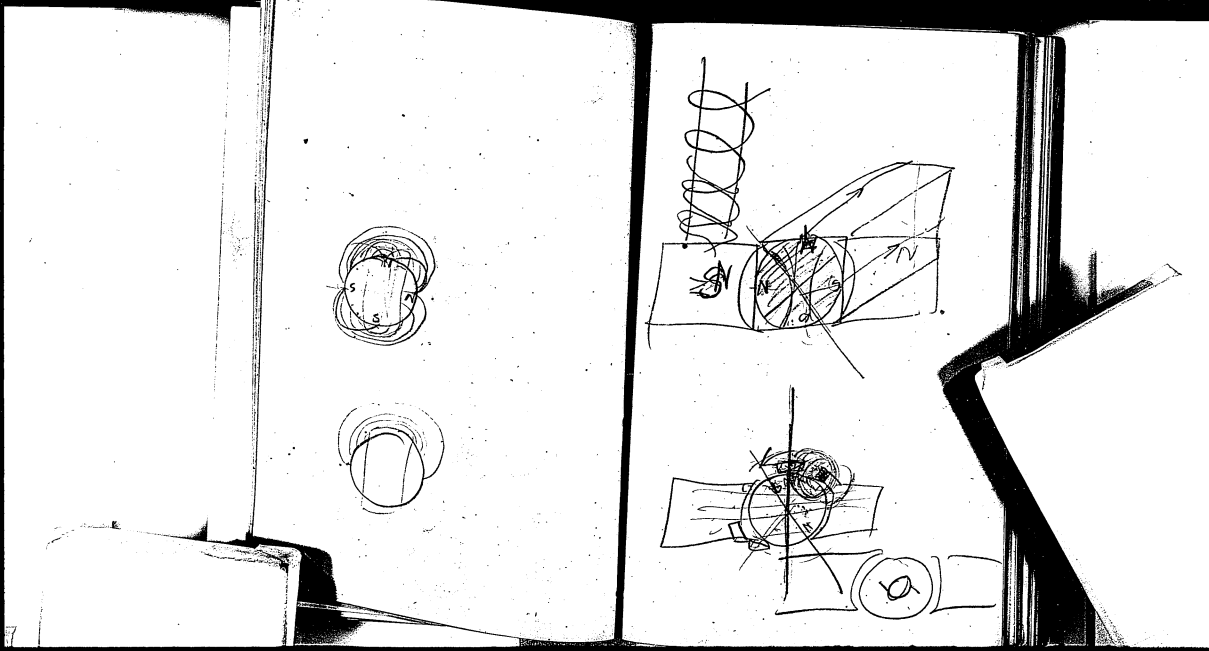
Beck Brothers
50 Fulton St., N.Y.

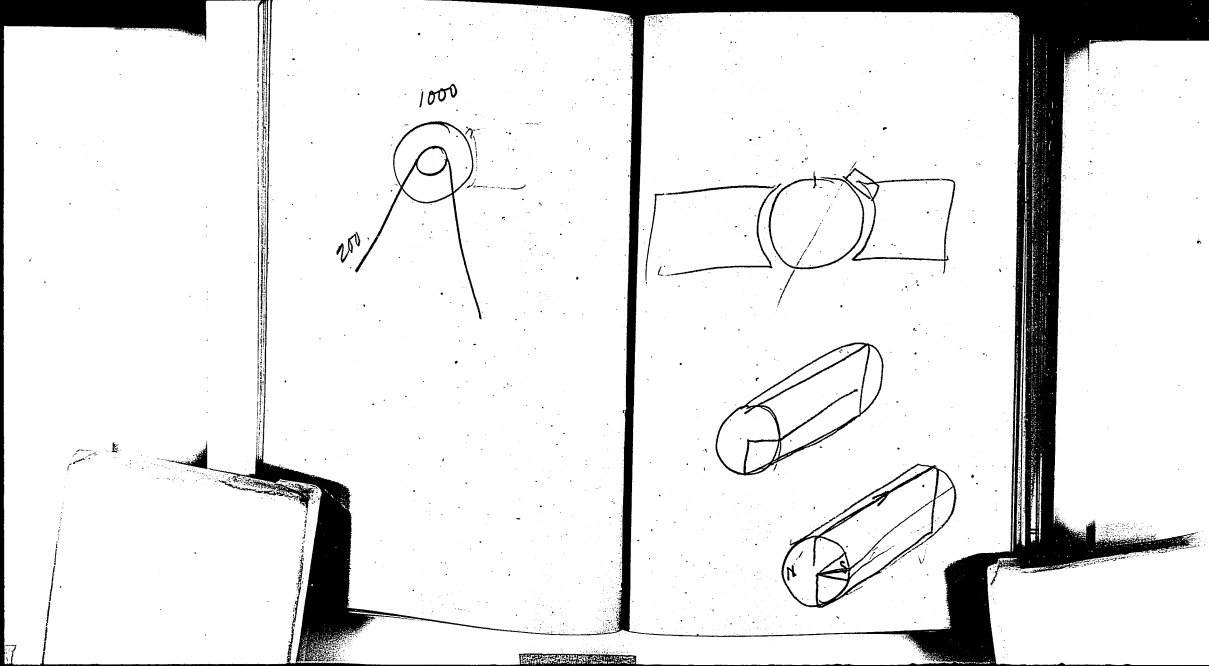
D. Ed Eggerts Sons
74 Wall St. N.Y.

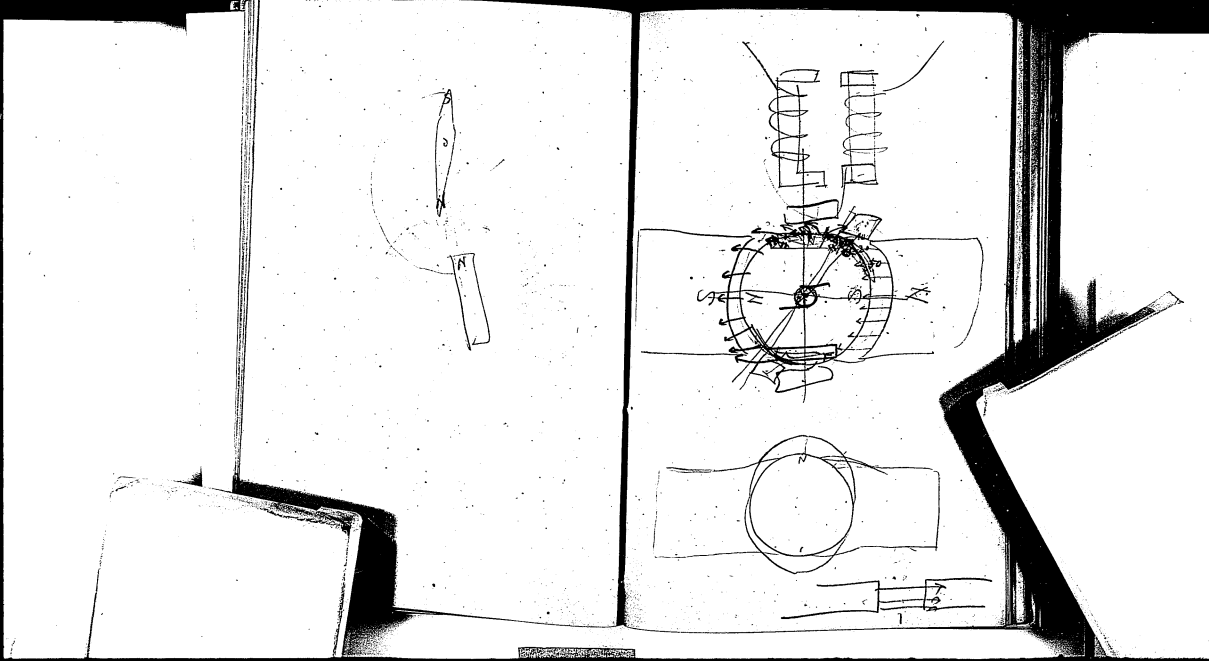
Hugh A. Hunter
1132 B'way, N.Y.

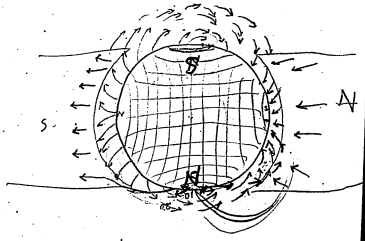
Franz Krogt
52 Nassau St., N.Y.



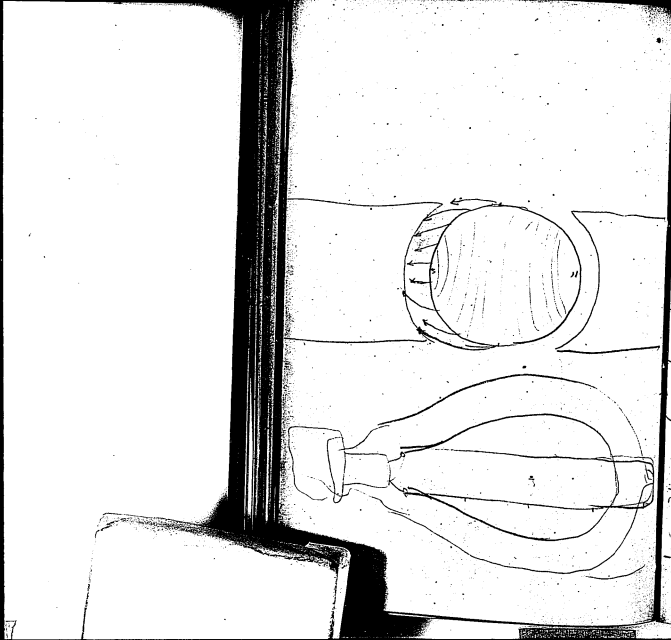



1000
200
N




S
N
S

S
N



N. Y. Physical & Optical Co.
2 W. 14 St. Jones St., N. Y.

Stackpole & Bro.
44 Fulton St. N. Y.

H. H. Wagner & Son
43 Maiden La. N. Y.

Alexander D. Elders
26½ Bway. N. Y.

John Pettit & Bro.
240 Pearl St., N. Y.

H. O. Darey & Sons
57 South & 115 Wall St. N. Y.

John H. Bearce
45 Lispenard, N. Y.

Boyd & Chase
E. 107 ½ c. First Ave N. Y.

Bausch & Lomb Optical Co.
37 Maiden La. N. Y.

Hugh N. Hunter
1132 Bway, N. Y.

Sussfeld, Lorsch & Co.
18 Maiden La. N.Y.

William Gibbons Sons
142 E. 23d St. Lex + Third Ave.
N.Y.

Jennings Bros.
57 Murray St., N.Y.

Albert Komp
186 Walker St.
N.Y.

Henry G. Hashagen
38 B'way, N.Y.

Georgs Hayes
71 Eighth ave.

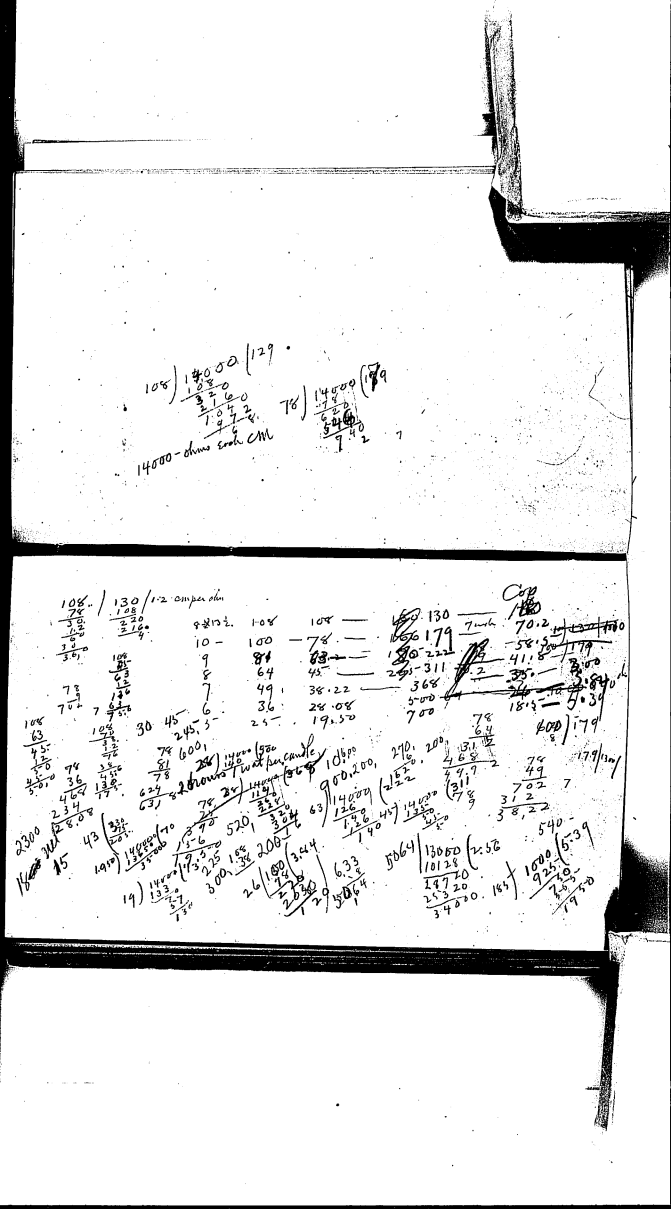
Victor E. Mauger + Petrie
110 Blade St., N.Y.

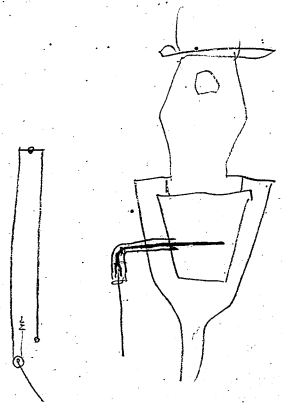
Phoenix Metal + Chemical Co.
474 Bleecker St., N.Y.

E. Lyon + Co.
476 Grand St., N.Y.

Chas. F. A. Hinrichs
31 Park Pl., N.Y.

Bucker & Sons
4 Murray St., N.Y.





Fairbanks + Co
311 B'way. N. Y.

Scales Howe
225 B'way. N. Y.

Healy Cooke
41 ~~Eighth~~ Eighth St. N.Y.

Jonathan Ward
155 Maiden La., N.Y.

Bradley + Carrier
54 Dey St. N. Y.

Penrhyn Slate Co.
50 Union Sq. c. 4th av + E. 17th St. N. Y.

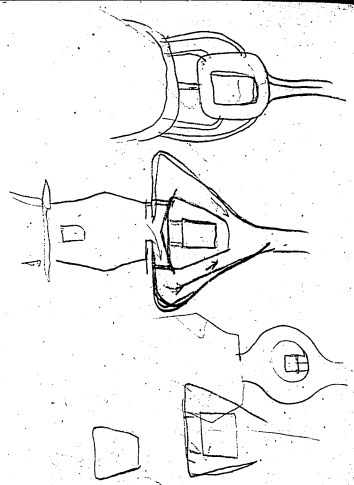
John F. Byrnes
22½ Centre St. N.Y.

Steiner, Kahn + Co.
478 B'way. N. Y.

Lalance + Grosjean Mfg. Co.
41 Cliff St., N.Y.

U. S. Stamping Co.
58 Beekman St. N. Y.

James S. Watt
81 Fulton St. N.Y.



Am. Wool Co.
116 Chambers St., N. Y.

Douglass Mfg Co.
45 Chambers St. N.Y.

Grasse & Co
62 Chatham St., N. Y.

~~Interchangable~~
Interchangable Wool Co.
57 Hudson St. N.Y.

Michael Lukanitsch
351 Broome St. N.Y.

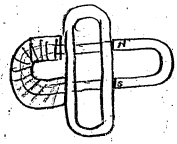
James T. Pratt & Co.
85 Fulton St. N.Y.

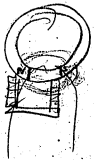
H. Prentiss & Co.
17 Dey St., N.Y.

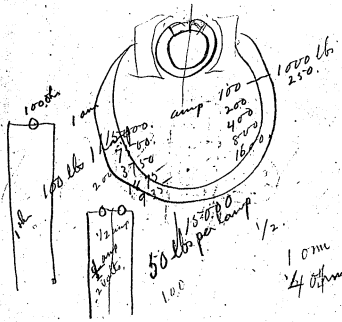
Francis Rodtfil
171 Suffolk St. N.Y.

Samuel J. Dwight
140 Centre St., N.Y.

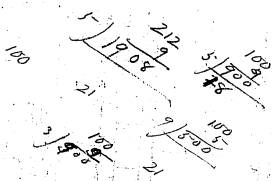
Herp & Co.
117 Pine, & 321 E. 22d St. N.Y.







30000 ~~Amp~~ Lamp 15000.
15000, 7500 —



400 | 30,000 (75
25,000
2,000
2,000

8
10000 ohm.

200 15 — 7.500 ohm
400 7500 3750
800 3750 1875
1600 1875 936.

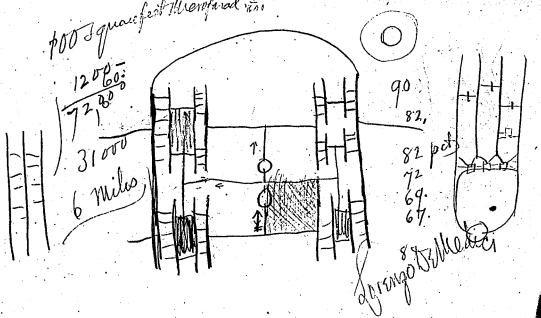
1 2 4 8 16

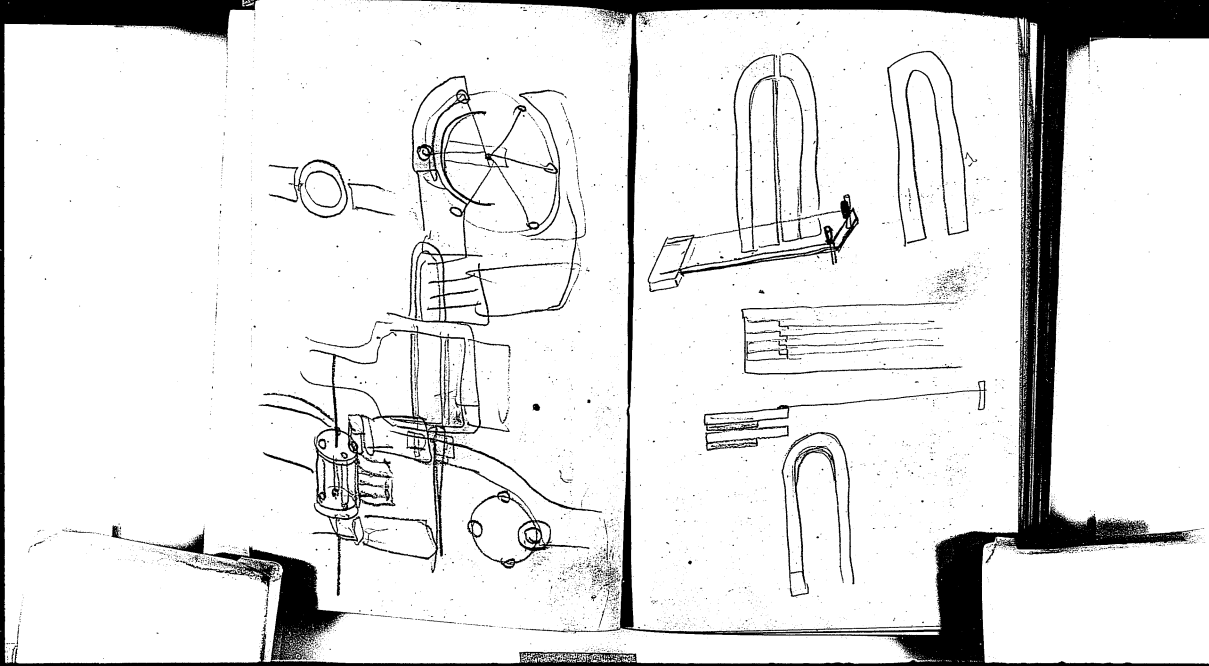
1800 lamps.

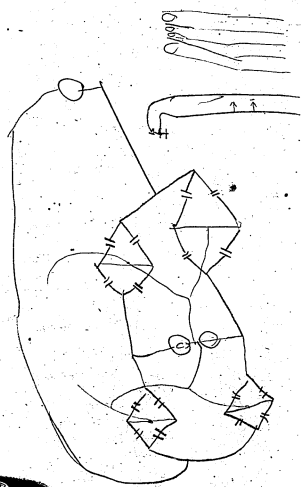
75
400
30,000

1 250.
1.25
1625
.3125

1000.
2
4
8
16
32


400 square feet interval
1200
72
31000
6 miles
90
82,
82 pct
72
69.
67.





Albert Berger & Co
47 Maiden La. N.Y.

Chas. Arnsheimer
67 Nassau. N.Y.

Israel Farjeon
75 Nassau. N.Y.

Henry Finnely
31 Maiden La. N.Y.

L. Hammel & Co.
9 Maiden La. N.Y.

Reichhelm & Koester
67 Nassau, N.Y.

Fredcrick Frasen
52 Nassau, N.Y.

~~Henry Finnerty~~
8 Maiden La. N.Y.

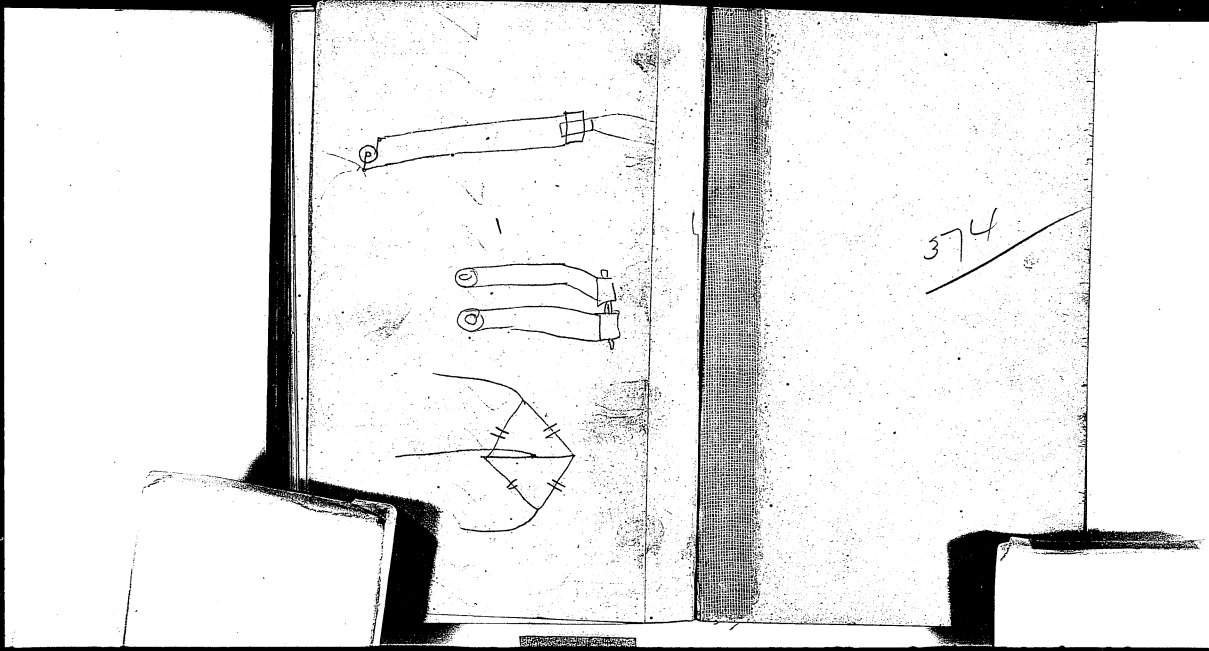
James M. Bottjen
111 B'way, N.Y.

C. Imhauser
212 B'way, N.Y.

William Buenzig
164 Allen St. N.Y.

Clinton Wire Cloth Co.
73 Fulton St. N.Y.

Passaic Fine Co.
113 Liberty St., N.


374